V4 A CYCLOPEDIA OF EDUCATION

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A
CYCLOPEDIA OF EDUCATION

EDITED BY

PAUL MONROE, Ph.D.
PROFESSOR OF THE HISTORY OF EDUCATION, TEACHERS COLLEGE
COLUMBIA UNIVERSITY

WITH THE ASSISTANCE OF DEPARTMENTAL EDITORS
AND
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A CYCLOPEDIA OF EDUCATION (4)

LIBERAL ARTS. — A term used in contradistinction to the fine arts on the one hand and the technical and practical arts on the other (for the former, see Art in the Schools, etc., for the latter see Industrial Education and Technical Education). The liberal arts have constituted from the time of the Greeks the curriculum of secondary and higher schools. The function of the liberal arts in education is discussed in the aspects in Art in Education; Course of Study, Theory of; and Liberal Education. The other aspects of greatest educational interest of the liberal arts concerns their organization into a curriculum and the development of scholastic degrees in connection with them.

During the Middle Ages the liberal arts were organized into a distinctive curriculum, including seven of the arts only. The "Seven Liberal Arts" included substantially all learning. These subjects comprise grammar, rhetoric, and dialectic, also called the trivium, and arithmetic, geometry, astronomy, and music, also called the quadrivium. The distinction between the lower and higher groups of subjects goes back to Plato, who found in music and gymnastics, the traditional Greek curriculum, sufficient material for the earliest stages of education, but organized an advanced stage in which the appropriate subjects were arithmetic, geometry, music, and astronomy. Dialectic or philosophy was recognized as a yet higher stage, appropriate only for the intellectual class. Aristotle's treatment of the curriculum is incomplete, and does not include discussion of the advanced stages. He adds reading, writing, and drawing to the traditional music and gymnastics of the old Greek curriculum. It is evident that he would add some study of the natural sciences to the advanced subjects. These were called the liberal subjects. The sophists and rhetors laid especial emphasis on the three introductory subjects, grammar, rhetoric, and dialectic, using dialectic to indicate logic, now scientifically formulated by Aristotle and no longer the general philosophical study of Plato. The Romans borrowed the Greek organization of learning, making it more systematic. M. T. Varro, a contemporary of Cicero and Cæsar, wrote a treatise, now lost, on *The Nine Liberal Disciplines*. To the seven of later authority were added medicine and architecture. Quintilian and Seneca wrote on these subjects, but assigned no definite number of studies to an approved curriculum. During the fourth century Martianus Capella (*q.v.*) wrote the *Marriage of Philology and Mercury*, in which for the first time the arts appear authoritatively as seven. The arts represent the bridesmaids in a heavenly wedding, and on the ground of their mundane characters medicine and architecture are omitted. At about the same period Augustine wrote a treatise on six of the liberal arts, omitting astronomy and possibly other subjects because of other work and interests.

Probably Cassiodorus (*q.v.*) (480–575) was the first to assign the limit of seven as authoritative. This he did in his treatise *De Artibus et Disciplinis Liberalium Literarum*, which formed a companion piece to a work on sacred literature, both written for his monastic brethren. Here the seven pillars of the temple of Wisdom referred to in Proverbs (ix, 1) is given as conclusive evidence of the fixity of the curriculum. Thus, as the Roman had absorbed the Greek, so the Christian accepts the Roman organization of learning. Isidore of Seville (*q.v.*), who comes shortly after, limits the subjects to seven and uses the terms *trivium* and *quadrivium*. Succeeding medieval writers indicate that the terms are fixed. Many of the great monastic leaders, later the schoolmen, and in fact all who wrote on education, give treatises on all or some of the seven liberal arts. Especially is this true of the earlier periods, with such as Alcuin (*q.v.*), Rabanus Maurus (*q.v.*), with whom, as with the later schoolmen, interest was more intense in philosophical and dialectic discussions. Painting, sculpture, and engraving add their testimony to the universality of this organization of learning even after the Renaissance brought that wider interest in knowledge which finally resulted in the overthrow of the fixed restricted conception of the limits and divisions of learning. Yet it must not be understood that the content of these various subjects was the same as in modern times. For the most part the extent of these subjects was far broader, even if the content of some of them was not so profound.

Grammar. — This subject included the study of literature as well as that of the grammatical structure of languages. Quintilian says of the subject (I, 4): "This profession, distinguished, as it is, into two parts, the art of speaking cor-

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rectly, and the illustration of the poets, carries more beneath the surface than it shows on its front." The same conception prevailed with the later Greeks. Dionysius Thrax (*c.* 166 B.C.) divided grammar into six parts: "(1) trained reading, with due regard to prosody; (2) exposition, according to poetic figures; (3) ready statement of dialectic peculiarities and illusions; (4) discovery of etymologies; (5) accurate account of analogies; (6) criticism of poetical productions, which is the noblest part of the grammatical art." The medieval definitions are quite as broad. Isidore defines grammar as "the science of correct speaking and of the sources and foundations of literature"; Rabanus Maurus, as "the science of interpreting the poets and histories and the method of correct writing and speaking."

Grammar was thus equivalent to our term "language and literature," and as such monopolized the attention of students during the early half of the Middle Ages and formed a broad foundation for the elaborated curriculum of the later Middle Ages.

The purpose of grammatical instruction was first, then, to give the student a working knowledge of the Latin language. To do this to those who had no vernacular training, since Latin had now become a "dead" language, or at least a foreign tongue, with few books for the students, was a new task. As aids to this new educational problem a great variety of texts were produced. Donatus (*q.v.*) still furnished the foundation. But a number of compilations of proverbs, fables, dialogues, or colloquies were produced to give a readier command through inductive methods. The so-called Cato's *Distichs* (*q.v.*), a series of 143 couplets or moral maxims, formed the most popular. Memorizing of these gave a vocabulary and a working knowledge. Other grammars supplemented those of Donatus and the more elaborate one of Priscian. (See LATIN LANGUAGE.) Some of these were component parts of encyclopedic works on the Seven Liberal Arts, such as those of Capella, Cassiodorus, Augustine, Isidore of Seville, Alcuin, and Rabanus Maurus. Each century, however, produced a number of independent treatises on Latin grammar, most of them introductory texts, more appropriate to the task of introducing the pupil into a foreign tongue in an age when general culture was at a minimum and books and other ordinary means of instruction were scarce. The most noted of all these texts was the *Doctrinale* of Alexander de Villedieu (*q.v.*), written in 1199. Its most striking characteristic was that it was written entirely in verse. When the method of introductory grammatical study was wholly by memorizing, such a text had great advantages. It became very popular, almost replacing the other text and rivaling Donatus. The *Doctrinale* embodied many of the changes which the language had undergone in the period intervening since Priscian's work, incorporated a vocabulary more necessary to the Church, and adopted methods more in harmony with the dominant dialectic interests. Other popular texts, such as Bethune's *Græcismus*, were also in verse. In addition to the grammars, numerous vocabularies appeared in the various vernaculars to assist the grammar student.

The extent to which the study of grammar introduced to a knowledge of literature is much disputed. Priscian quotes the *Æneid* of Vergil more than 700 times in his grammar. Aristophanes, Aristotle, Julius Cæsar, Cicero, Demosthenes, Herodotus, Homer, Horace, Juvenal, Lucretius, Ovid, Sallust, Terence, and other writers are also quoted, some of them more than a hundred times. Naturally none of the later texts contained anything like this amount of literary material. But a thorough study of Priscian would give a fair introduction to some of the Latin authors. To what extent the authors themselves were read is even a more disputed question. Whatever the facts may be, it is evident from recent investigation, that the old opinion concerning the ignorance of the Middle Ages must be revised to a very considerable degree. Theodulphus, Bishop of Orleans and successor of Alcuin, states that he actually taught from Vergil, Ovid, Pompeius, Sedulius, Rutilius, Arator, Fortunatus, Juvencus, Prudentius. A century later Walter von Spier comprised in his grammatical studies Vergil, the Latin Homer, Horace, Persius, Juvenal, Statius, Terence, Lactantius, Boethius, and Constantine. Such lists could be extended indefinitely. Students from various centuries have left testimony as to literary activities quite as extensive. It is but natural that the Christian authors should predominate. But a knowledge of classic literature was not extinct.

Rhetoric. — This formed the most important subject of study in Roman education, but during the Middle Ages it was the least important of the subjects of the trivium. Rhetorical training was essential in a society where political interests were dominant, but it had little significance in the training of the clergy or the men of public affairs during the Middle Ages; for church services called for little or no oratorical power, and public affairs developed no learned or trained class aside from the clergy. Rabanus Maurus states in his treatise on rhetoric, "It is sufficient if youths give some attention to the study of rhetoric. Even then not all who expect to enter the priesthood, but only those who are not as yet obliged to devote their time to pursuits of greater usefulness, should study the subject. At any rate one who wishes to acquire the art of eloquence can do so more advantageously by reading and hearing great orators than by studying the rules of rhetoric." But there was a general need in an uncultured society for a professional class that could write and compose the various documents necessary in the complicated ecclesiastical, legal, and political life of the times.

The study of rhetoric then became directed to two objects: training in composing letters to various people in authority and in constructing various documents such as contracts, wills, decrees, deeds, commendations, immunities, or records of any kind. The first was known as *Epistolæ*, the second as *Dictamen* (*q.v.*). While the various encyclopedic texts, based largely on the old Roman writers, such as those of Cassiodorus, Capella, Isidore,. and Rabanus Maurus, continued to be used to some extent, far more popular were the various textbooks prepared on *Epistolæ* and *Dictamen*. The former texts dealt in a formal way with the superscription, salutation, exordium, narration, petition, conclusion, and subscription; the latter contain models for the various kinds of documents needed in temporal and ecclesiastical affairs and in common life, such as privileges, commissions, citations, donations, petitions, exemptions, visitations, etc. Many manuscripts left are the dictation of teachers or the exercise work of scholars, and it is now thought that frequent instances of this character were but recently held to be pious forgeries of designing ecclesiastics. With the founding of the universities the study of rhetoric merged into the study of Roman law, into which the Dictamen developed. In some universities, courses in the *Ars epistolandi* were also given.

Logic. — This subject was identical with dialectic, but though closely bound up with philosophy and metaphysics, did not include them as a school subject. Especially during the early Middle Ages were metaphysical and philosophical interests quite foreign. With the development of theological interests in the eleventh century, metaphysical distinctions and philosophical doctrines became of great importance; but it was only with the development of the universities and the recovery of the work of Aristotle that philosophy was added as a distinct part of the curriculum. The writings of Boethius (*q.v.*) were the sources from which the early Middle Ages drew its knowledge of logic. While with Boethius the metaphysical and philosophical implication and the relation of logic receive the greatest attention, it was his formal logic that was drawn upon for textbook purposes. Similarly Cassiodorus, Capella, Isidore, and Alcuin furnished in their encyclopedic treatises text for common use. But these again dealt almost exclusively with formal logic. With the rise of theological discussion following Rabanus Maurus and Scotus Erigena, logic became of transcendental importance, was generally mentioned second in the trivial studies, and in reality replaced grammar and its inclusive though superficial study of literature.

While from now to the close of the Middle Ages logic was the subject of greatest importance because it became bound up with all other aspects of study and all phases of intellectual interest, yet as one of the Seven Liberal Arts studied in the schools and the universities it was formal logic alone. Logical metaphysics was reserved as a part and function of theology. Both during and preceding the university period numerous brief school texts on formal logic appeared. By far the most famous of these was the one by Petrus Hispanus (d. 1277), which was very generally used for 300 years.

Arithmetic. — The church was interested in the study of arithmetic, astronomy, and music, the major portion of the quadrivium, as well as in the study of the trivium. The standard encyclopedic texts of Boethius, Cassiodorus, Isidore, Alcuin, Rabanus were the basis for the study of arithmetic. While following this period numerous treatises and textbooks on arithmetic were produced, there was really no creative work and no advance made in the subject until the thirteenth century. At this time the algoristic or Arabic notation came into general use. The chief practical arithmetical interest was in the calculation of Easter. The works of Bede and of Rabanus Maurus were the chief treatises. The ordinary monk or priest, by the use of Bede's rules, could compute Easter with a knowledge of the four fundamental processes. Numerous church synods required this much arithmetical knowledge of all priests, and after the time of Charlemagne this knowledge was fairly general. To such an extent did the computation of Easter, and one other practical problem — the use of the abacus (*q.v.*) — make up the whole of arithmetic, that the ordinary term for the subject was *computus*. But the older texts, based upon Boethius, hardly touched the practical aspect of the subject. They scarcely have a reference to a rule of operation. They are devoted for the most part to a classification of numbers, a study of their properties, mystical, symbolical, and otherwise. Bede and Rabanus depart from this, later minor textbook rules follow them, and in the last centuries of the Middle Ages a great variety of texts appeared. The advance in arithmetic dates from Gerbert (*q.v.*), later Pope Sylvester, to whom is attributed by some the introduction of the Arabic notation. Without question he introduced the columnal computation and the methods of fundamental operation substantially as they are to-day. The introduction of the Arabic notation was very gradual, and its general acceptance was the work of the thirteenth and following centuries. Boethius persisted as a text into the sixteenth century. From the opening of the thirteenth century, arithmetic found new utilization in commerce and industry, and there were two distinct types of arithmetical texts corresponding to the two types of mathematical interests, — the theoretical and the practical. In fact, these aspects appeared as two distinct subjects, *arithmetica* and *algo-*

rismus. The former was encouraged in the universities, though some, such as Paris, gave little or no attention to arithmetic. In some institutions, as Vienna and Leipzig, both subjects received attention. (See ARITHMETIC; ALGORISM; COMPUTUS; NOTATION.)

Geometry. — The course followed by geometry was much the same as in the case of arithmetic. In the early third of the Middle Ages it was studied exclusively from the encyclopedic texts, though the treatise of Boethius seems to have been unknown. The scope of the subject, however, was that indicated by the etymological significance of the term. It corresponded to modern ideas of geography plus the rudiments of surveying. It was based on Pliny rather than upon Euclid. Capella adds some treatment of lines, circles, triangles, chiefly of their symbolic meaning. Rabanus writes *On the Universe* as a treatise in geometry. With Gerbert in the tenth century, a knowledge of Boethius's summary of Euclid was again brought to light. In extent it was limited to the first four books of Euclid, with full demonstrations of only three or four propositions. From the thirteenth century on, beginning with translations from Arabian sources, the subject rapidly expanded.

Astronomy. — In the quadrivium this was the most popular as well as the most practical subject. Its practical use in the calculation of the calendar and in the construction of the sundial gave it a greater everyday value than arithmetic, with which it was closely bound up. Its general aspect was astrology, which was of far more practical concern to the common man than modern mathematical astronomy. In fact, astrology was related most intimately to every aspect of everyday life, and as such was a study of utmost practical concern. Whether astronomy or astrology, it was the same symbolical and mystical interpretation of phenomena that so characterized all of the theoretical study of that period. In addition to the symbolical material, the ordinary texts included the elements of mathematical geography to about the same extent that a modern school geography does, making allowance for the difference in actual scientific knowledge. Such texts were those of the encyclopedists Capella, Cassiodorus, Isidore, Alcuin, and Rabanus. Bede's work was more comprehensive. In the early university period translations of Ptolemy and of Aristotle *On the Heavens* were introduced and widely used. Elementary texts, especially that of the English monk, Sacrobosco (thirteenth century), appeared and were widely used. The general interests in and the character of teaching of astronomy in the later Middle Ages were such as to afford an excellent foundation for the rapid advance made in the Renaissance period. (See ASTROLOGY; ASTRONOMY.)

Music. — As one of the Seven Liberal Arts, music had little in common with our modern idea of music. It consisted of the mathematical study of music, together with mystical and symbolic study of numbers after the Pythagorean ideas. It concerned itself neither with singing nor with ability to perform on an instrument. There was some practical study of music, made necessary by the church services; but this was not a liberal art, and the development of secular and folk music did not begin until late in the medieval period. As long as the Greek ideas of music prevailed, — and this was for the greater part of the Middle Ages, — there was no escape from these conditions. Boethius was the standard text, as he continued to be in the universities down into late modern times. Cassiodorus, Isidore, and other encyclopedic texts were used, but they were for the most part condensations of Boethius. Music in this sense was a part of the regular university course, and also appeared very generally in monastic and cathedral schools throughout the Middle Ages.

The later historical aspect of the arts curriculum is considered in the articles on each of the subjects mentioned; UNIVERSITIES; COLLEGE; COLLEGE, AMERICAN; incidentally in the articles on DEGREES and related topics. See also the cross references given under MIDDLE AGES, EDUCATION IN.

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LIBERAL EDUCATION. — The conception of liberal education dates from Aristotle. He distinguished sharply between a liberal education, an end in itself, and a mechanical or professional training, a means for practical ends beyond itself. The chief traits of a liberal education were its association with leisure and its exclusive connection with the faculty of knowing. These two traits were necessarily combined with each other. Slaves, serfs, mechanics, tradesmen, were too much occupied with practical matters to have the leisure requisite for devotion to knowing for its own sake. Only a leisure class was in a situation to devote itself to the cultivation of the mind for the sake of the mind. Even in theoretical matters, however, excessive assiduity evinced an illiberal spirit. The chief material of a liberal education was music (in the Greek sense). The question how far practice was necessary was decided by applying the criterion suggested above. If skill in doing became the chief end, the study was illiberal. Practice for the sake of doing should be relegated to the servile, unfree class of artisans. In a liberal education that amount of practice should be permitted which would promote the understanding and enjoyment of the arts as practiced by others.

The distinction between liberal and servile education was thus based by Aristotle upon the distinction of classes upon which Greek society was founded. Practice and education for practice were essentially illiberal because pursued by persons who were not free themselves or, who if legally free, were so given up to the narrow ends of money making, etc., as to have no interest in the exercise of the knowing faculties for their own sake. This exercise was the appropriate and congenial function for those whose social station relieved them from all menial preoccupations.

The distinction between the free character of knowing and the subservient character of doing which underlay the Aristotelian definition of a liberal education was also associated with several points in his metaphysical and ethical system. Pure knowing, concerned only with the rational relations of immaterial forms, was, according to Aristotle, the highest thing in the universe. It was the final cause of the existence of nature, the supreme end and good. It defined the nature of God as pure activity. It dealt with the reason, the explanation of all else, and was complete in itself — just as a syllogism is self-inclosed, needing no help from outside. In contrast, doing or practice sprang from appetites, which are bodily, not ideal: expressed needs, lack, incompletion, imperfection, and in general was due to man's share in the animal, not the divine nature. The highest, the freest, or most liberal of all pursuits was a theoretical contemplation and inquiry which were supra-civic.

Aristotle's distinction became basic in all later definitions and classifications of education. It took specific effect in the conception of the seven liberal arts (*q.v.*). His assertion of the supremacy and divinity of the purely theoretical life was employed in the middle ages to justify theology as the supreme study, and to place the monastic life above not only secular careers but above that of the parish clergy — the latter being devoted to necessary practices and not to the exclusive cultivation of divine knowledge.

At the time of the revival of learning, however, the domination of theology and allied concerns was taken as a symptom of a professional education, that preparing for the clergy. Liberal education was identified with the humanistic studies, a knowledge of classic antiquity and the Greek and Latin literatures. Although the older classification of the seven liberal arts survived, these arts — such as grammar, rhetoric, logic — were identified, not with "sacred" grammar and rhetoric and with the logic which was a handmaiden of theology, but with that of classic literatures. However, the interest in the content of these literatures tended, while reviving the idea of liberal education, to relegate its conventional divisions to the background.

In the eighteenth century the rise of natural science began to disturb the now orthodox identification of the liberal with the ancient languages. Pure mathematics was unambiguously taken in the fold; the other sciences were left as doubtful claimants. In the nineteenth century the further development of literature and philosophy in the vernacular tongues of Europe gave the living languages a claim for recognition as elements in liberal education. The growth of history and the social disciplines perturbed the content of the idea still further. Liberal education had claimed to be the peculiar representative of man as man, of human interests as such; and history, anthropology, political economy, and sociology seemed to concern themselves with humanity even more directly than did the classic literatures.

As a consequence of such causes, practically all attempt to define a liberal education by some principle of content has been given up, though it is still generally felt that Greek, Latin, and mathematics, at least from algebra through calculus, are peculiarly liberal in character. The attempt is now made to define it from the standpoint of aim, or of a peculiar, if intangible, influence it exercises upon those devoted to it. This end and effect are more easily stated from the negative side than from the positive side. Some would call it scholarship and would say that higher education, as distinctly representing the liberal interest in education, should be given to the promotion of scholarship. Among those representing this idea there is, however, a marked difference of attitude. Some would include research and discovery in the province of scholarship, while others would exclude them as specialized and technical. Many deny the claim of scholarship to represent the cause of liberal education and would substitute a specific refining and ennobling of the mind known as culture. However, the status of various subjects with respect to their power to bestow culture is involved in much uncertainty and polemic discussion. Negatively, the conventional idea of a liberal education is more easily made out. It excludes education designed to prepare one for any special calling, particularly if this calling is closely associated with money making, or if preparation for it involves much manual manipulation and dexterity — such as the laboratory pursuits of a technological education. Latterly, it has been held by professed upholders of the cause of liberal education that it is opposed to education for social service. This notion, however, is mainly an American innovation. Historically, the chief pursuit of the leisure class has been statecraft and diplomacy. One of the leading marks of liberal studies was that it prepared men for managing the state, including the lower classes. In the United States, with the development of democracy, the notion of a special ruling class with a special education fitting it for social control has disappeared. Accordingly education for social service is no longer education for directing the affairs of other people, but for contributing to their happiness and well-being. Such a conception would let in the physician and the engineer. Consequently it is too broad for the purposes of the traditional notion of liberal education.

The fact is that in a society which frankly bases its constitution upon class distinctions, it is comparatively easy to assign a distinct content and a distinct purpose to liberal education. With the growth of social studies, of the democratic ideal, and the increased application of the best scientific intelligence to the conduct of practical affairs, it becomes increasingly difficult to do so. Liberal education becomes a name for the sort of education that every member of the community should have: the education that will liberate his capacities and thereby contribute both to his own happiness and his social usefulness. It has value as a limiting concept to criticize various educational schemes. Thus an education in Latin and Greek may be quite illiberal if pursued by methods which restrict the play of the imagination and the sympathies, and bind down mental appreciations to one limited sphere. The same is obviously the case with education for law, medicine, engineering, or the clergy. In short a liberal education is one that liberalizes. Theoretically any type of education may do this. As matter of fact, all of them fall much short of accomplishing it, some in one respect and some in another. In so far they fall short of being an education in any worthy sense of the word. J. D.

See ACTIVITY; CULTURE; HUMANISM; LIBERAL ARTS.

LIBERIA, EDUCATION IN. — Liberia is an independent negro republic under the control of black men, and has maintained its sovereignty for sixty-four years. It extends 350 miles along the coast of West Africa and 200 miles into the interior, and possesses thirteen ports of entry. The population is above one and a half million, of whom 25,000 are emigrants from the United States and their descendants. Planted by the American Colonization Society in 1817, Liberia declared its independence in 1847. In language and institutions the leading people are strongly attached to the United States.

The American-Liberians exercise ever increasing authority over the aboriginal tribes, which, however, are dominated by several native chiefs. A strip of land twenty to eighty miles broad extending along the Atlantic coast is effectively administered by the government, which is modeled on that of the United States. The coast region is divided into four counties, Bassa, Sino, and Maryland, each under a government superintendent, and Montserrado, which is subdivided into four districts, each under a superintendent. This local organization has facilitated the progress of public education. The government system is based upon an act of 1869 providing for the maintenance of at least one public school in every settlement and township in each county. The act called for an annual appropriation of one thousand dollars from each county treasury to be applied to the support of public schools, and the levy of local taxes for the same purpose. By a second act of the same year the legislature created an Interior Department charged among other duties with the educational interests of the republic. A supplementary law provided for the appointment of a commissioner of education in each county, subject to the Secretary of the Interior. Prior to 1869 missionary societies had been actively engaged in efforts for the instruction and elevation of the people of Liberia, and the two principal church associations represented in the field, the Methodist Episcopal Church of the United States and the American Protestant Episcopal Church, had already made great progress in establishing schools when the government system was inaugurated.

In 1900, or thirty-one years after the passage of the first education act, the government was excited to new effort in this matter, and the legislature provided for the appointment of a superintendent of public instruction charged with the immediate direction of public schools throughout the country. Specific regulations were at once issued for the guidance of teachers and local school officers. The provision for a local school tax had proved futile, and the legislature assumed the support of the public schools by an annual appropriation.

As to the actual provision of schools in this republic, the latest reports give the following particulars. The Methodist Episcopal Church maintains schools in every county, having a little more than a thousand pupils on their rolls, including aborigines and Americo-Liberians. The former comprise about 57 per cent of the total number, and their ratio is steadily increasing. The central school of this system is the College of West Africa, located at Monrovia. It was founded in 1839, and accommodates about a hundred students in the several departments, theological, collegiate, and preparatory. Special provision is made for industrial training. Many of the leading men and women of the country, including a large number of efficient teachers, were educated in this institution. The Protestant Episcopal Church maintains many schools, which center about four principal institutions; namely, Epiphany Hall, at Cuttington, Cape Palmas, comprising a high school, collegiate department, and divinity school; a girls' school and orphan asylum at Mount Vaughan, near Cape Palmas; St. John's School, for boys, at Cape Mount; and a school for girls at Clay-Ashland. The latest statistics show a total of fifty schools in this system, of which twenty-seven were for day pupils only and twenty-three boarding schools. The enrollment in the schools in 1905 was about 1500, of which number 74 per cent were native Liberians. The schools of this system are under the close supervision of a resident bishop. The average annual salary of the teachers ranges from $150 to $300, which exceeds the average in other mission schools. The Lutheran Church also maintains a few schools among the native Africans at the Muhlenberg station.

The government school system in each county is under the direction of a local school commissioner. The latest statistics give a total of 102 schools, each under a single teacher, and a total enrollment of 3320 pupils, of whom about one fourth are aborigines.

The chief national institution is Liberia College at Monrovia. The institution was founded by the efforts of the Massachusetts Colonization Society, and was placed under the control of two boards of trustees, one representing the society and the other the legislature of Liberia. The college building was furnished by the Boston board at a cost of $20,000. Liberia gave the twenty acres which form the campus of the college and a grant of 1000 acres of land in each of the four counties of Liberia as an endowment. The college was opened for students in 1862, and after varying fortunes passed to the sole control of the republic in 1890. Since 1900 the income of the college from public sources (taxes and endowment) has averaged about $25,000, annually, and additional funds are also supplied from America. The college has the benefit of several public scholarships endowed in the names of men who have rendered unusual service to the country. The latest statistics show a registration of 120 students, including both young men and young women, and a corps of twelve instructors. The college is the alma mater of the most prominent citizens of the country, among the number being the former chief executive, Honorable Arthur Barclay.

Industrial education is a feature of both denominational systems. At the White Plains' school and the Sinoe River Industrial School, sustained by the Methodist Episcopal Church, students are taught building, woodwork, masonry, brickmaking, farming, and the cultivation of cotton, ginger, and rubber. The College of West Africa has a printing department, in which job work is done, and the *Liberia and West Africa* and other papers are printed. Most of the work is done by native Africans. In the college proper the girls are trained also in domestic economy, housekeeping, dressmaking, fancy work, and kindred arts. In the Protestant Episcopal schools industrial training is given at the four chief centers of education. At Epiphany Hall students are taught the cultivation of coffee, cotton, and rubber; at St. John's School, Cape Mount, there is an agricultural department, in which rice is raised with success, and efforts are being made to secure facilities for teaching other industrial arts. A beginning has been made in industrial training in the public schools. At Rick's Institute, at Kai-Poo, the work consists chiefly of the cultivation of coffee, and the farm yielded 3000 pounds in 1902, 1600 in 1903, and 1400 in 1904. An excellent printing department has been fitted up at Liberia College, and other industrial work is being gradually introduced.

The American Colonization Society has aided schools in Liberia from time to time, in particular the school at Mt. Coffee, forty miles from Monrovia. This school has been the especial charge of the Mt. Coffee Association of America, of which Dr. Edward Everett Hale was an interested and active member. The Colonization Society, as trustee for a fund left for schools by a Mr. Graham, supports two schools, which bear his name. Graham School, No. 1, is located at Greenville, Sinoe County; reports from teachers beginning with the year 1905, and ending with Mar. 31, 1911, show the total attendance of scholars to have been 1261, Liberian boys and girls, 993; native boys and girls, 268. Graham School, No. 3, is located at Royesville, Montserrado County; the report of the teacher for the five years ending Mar. 31, 1911, shows the total attendance of scholars to be 447, Liberian boys and girls, 243, and native boys and girls, 204. The present President, Daniel Edward Howard (inaugurated Jan. 1, 1912), is emphasizing the needs of improving the public school system, of agricultural education, and of Liberia College. I. M. C.

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LIBERTY COLLEGE, GLASGOW, KY. — An institution for the higher education of women, founded in 1874. In 1911 there was amalgamated with it the Florence University for Women, Florence, Ala. Preparatory, collegiate, normal, commercial, music, art, and domestic science departments are maintained. The entrance requirements are equivalent to about three years of high school work. The degrees of B.A., B.S., B.C., and M.A. are conferred.

LIBRARIES. — Historical. — *Babylon and Assyria.* — The temples of the ancient cities which lie between the Tigris and Euphrates, such as Telloh, Nippur, Sippar, Borsippa, and Nineveh, were administrative and literary centers as well as the shrines of gods. From ten to thirty thousand inscribed clay tablets in each temple preserved official record of battles and of the divinations which foretold success or failure. There were also treaties, petitions, diplomatic letters, laws, deeds, and church rituals. These constituted royal or national libraries, presided over by Nebo the god of learning, and under the care of the king-priest or a high official.

Later when Hammurabi (*c.* B.C. 2200) became chief ruler in Babylonia, Mardik was advanced to be the head of all gods, and Babylon became the center of records and learning. Hammurabi's famous laws were cut into the wall of the temple. These records and others were brought together by Ashurbanipal (B.C. 671–626) at Nineveh when he became King of Assyria. Copies of inscriptions on monuments of victories and of all national legends were here recorded on clay tablets and cylinders. These were arranged by classes, were catalogued, and indexed by title. Many of those which describe divinations had excellent drawings to illustrate the text. A century later (Ezra v, 17) Darius ordered a search to be made in the hall of books at Babylon for a decree regarding the house of God at Jerusalem.

The temples were great schools, and popular, because preferment, as in the Middle Ages, came through the priestly office. The libraries had many easy texts and vocabularies for boys to study. Ashurbanipal says that he had studied at the temple, probably as a youth.

Egypt. — At El-Amarna, the Egyptian capital of the Pharaoh Akhuaton, who tried to uplift religion and free art from convention, much of the national library has been found, composed chiefly of correspondence with provinces and with kings in Western Asia. These archives were in charge of Tetou-nou, an Egyptian, whose assistant was Shamas-Niki, a Babylonian. The hieroglyphic writings of Egypt never supplanted the cuneiform of Babylonia as the language of culture and diplomacy, and Shamas-Niki must have been indispensable. The papyrus plant which furnished food, fuel, and clothing for Egypt became the fragile medium for perpetuating her writings, until parchment or prepared skins came into use. There were many papyrus collections in Egypt (see Richardson's *Some Old Egyptian Libraries*, 1911); but the great library at Alexandria grew up under foreign influences, the product of one of many long periods of foreign domination of the Nile valley.

Greece. — Greece left records of books, book selling, and schools, but little of libraries. Demetrius Phalerius, poet and orator, honored with as many statues as there are days in the year, fled to Alexandria, and there advised Ptolemy in his plans for a great library, although Aristotle is said to have aided in the arrangement. Aristotle's own library (*Strabo* XIII, 1, § 54) passed to Theophrastus and from him to Neleus of Scepsis, where it lay hidden to escape the rapacious bibliophile kings of Pergamum until bought by Apellicon of Athens. Sulla the dictator and book-lover carried the collection to Rome to have its texts copied and spread abroad.

From Ephesus, where, we are told, there was a book chained to the door of Diana's temple, came Zenodotus (B.C. 280) to manage the Alexandrian library, to walk in its colonnades with peripatetic teachers, and to dine in rooms set apart for its students. This was the mother library, distinguished thus from the daughter library in the temple of Serapis. The older collection was in part destroyed by Cæsar, but Antony gave 200,000 manuscripts of Pergamum to Cleopatra for the Serapeum. Of this great library fleeting and uncertain glimpses appear in 391, when Theodosius ordered its destruction, a generation later when Orosius says that he saw ancient books in Alexandria, and in 640, when Amrou, the great caliph Omar's lieutenant, is said to have used the remnant for fuel.

Rome. — M. Terentius Varro, author of a work entitled *De Bibliothecis*, now lost, was commissioned by Julius Cæsar to collect books for a library. Under succeeding Cæsars Rome became a city of libraries, to which students of the many schools of oratory and philosophy resorted. Telephus, a grammarian of Pergamum in A.D. 117, is said by Suidas to have issued a *Notitia librorum* which described minutely the libraries of his time. Forty years earlier Crates, ambassador from Pergamum, probably stimulated an interest in libraries while lecturing on grammar at Rome. C. Asinius Pollio, the general, poet, and friend of Vergil and Horace, founded the first library in Rome from spoils of his Illyrian campaign, B.C. 39. Pliny calls him "the first to make men's talents public property," but Plutarch claims this honor for Lucullus.

The Porticus Octaviæ, a typical Roman library between the Capitoline Hill and the Tiber, was founded by Augustus. It has temples to Juno and Jupiter, connected in the rear by a long schola, or hall for conversation. A space of equal length behind the schola had three divisions: a middle section, the curia, devoted to meetings, with the Latin library at the left and the Greek library at the right. About this compact building there was a double colonnade 443 feet by 377 feet, to provide, as at Alexandria, a meeting place for master and pupils. Rome had nearly thirty libraries, to which Vespasian and Trajan made large additions. Their manuscript rolls were kept in bookcases or presses, inlaid, and surmounted by busts, unless there were portraits on the walls. There was usually a director with a subordinate in charge of each language. Men like Lucullus lavished money on their libraries until Seneca spoke bitterly of books as "ornaments of dining rooms," reaching to the ceilings. He adds: "Nowadays a library takes rank with a bathroom as a necessary ornament to a house. I could forgive such ideas if they were due to extravagant desire for learning" (*De tranquillitate animi*).

Middle Ages. — Christianity did not alter the form nor greatly abate the luxury in libraries. Eusebius, in his *History*, speaks of Bishop Alexander's library at Jerusalem (A.D. 250) as a storehouse of knowledge. St. Jerome worked in the library of Pamphilus in Cæsarea in Palestine, and calls the founder a rival in zeal of Demetrius Phalerius and Pisistratus the tyrant. In the early Christian Church the apses on either side of the altar were used to store the altar vessels and ritual books. Thus one apse came to be used as a religious or monastic library. Christian enthusiasts retreating into the deserts and mountains to escape luxury needed books to keep themselves from ignorance. From them first came primitive library rules. Those of St. Pachomius (A.D. 292–345) were developed near Denderah in Upper Egypt. St. Benedict perfected library administration, and his successors influenced the government of early college libraries. (Clark, *Care of Books.*) Monte Cassino, Saint Gall, and Cluny are examples of these Benedictine libraries.

In the manuscript era the monks of monastic libraries were also publishers and booksellers. The Abbot Loup of Ferrieres kept a depot for books at S. Josse-sur-Mer. Others were at Wearmouth and Yarrow. Becker estimates that from A.D. 750 to 1200 there were 136 libraries in monasteries, with about 12,000 books in all. Of these about thirty were complete Bibles.

The two great figures in medieval learning were Cassiodorus (*q.v.*) and Alcuin (*q.v.*). Cassiodorus maintained a scriptorium where his monks copied the classic authors. Alcuin simplified the forms of written letters and stimulated scholarship. There are many woodcuts of the early years of printing which depict the monk in his library or scriptorium. Cassiodorus said: "As the antiquarian copies the words of Christ, so many wounds does he inflict upon Satan." Here was the inspiration of medieval book making. Some of the best work was done by the Benedictine nuns, and trial pages written by nuns of St. Mildred's Abbey, Isle of Thanet, still exist.

By a law of recompense, the era of fanaticism that effaced or destroyed many manuscripts was followed by the age of printing. Books became cheap, and libraries leaped from a hundred to a thousand volumes. The scriptorium lost its influence, however, as a part of the monastic library. The *Ars Moriendi*, the *Biblia Pauperum*, the rude picture book of the Bible story, and the *Donatus* or popular grammar were multiplied beyond the dream of Cassiodorus. Then movable type came, and the modern library was inevitable. Before the voyages of Columbus there were printing presses in 236 cities in Europe, with over a thousand printers. A million books were issued with good ink on durable paper before the end of the fifteenth century. The Bible, following Christian missionaries into every country, taught the world to read. "Some," said Fox, "gave a load of hay for a few chapters of St. James or of St. John in English."

Richard de Bury (*q.v.*), who finished his *Philobiblon* in 1345, shows forth the spirit which governed cathedral and university libraries in England. The general attainment of learning had grown to such proportion that Bishop Carpenter's librarian at Worcester in 1464 was required to be a graduate in theology and a good preacher. It was his duty to explain hard passages in the Bible, make lists of the books in his keeping, and examine the shelves each year on the Friday after the Feast of Relics (in January). At St. Martin's, Dover, now part of Dover College, the administrative details, worked out very thoroughly, have been preserved. At Pembroke College the titles of books were written on parchment attached to the left half of a board. The right half was covered with a thin layer of wax, on which the name of a borrower might be scratched in line with the book's title. The borrower deposited a "pledge," sometimes the value of the book, or an agreement in writing.

Education in 1400 is reflected in the character of college libraries in England. Theology and kindred subjects claimed three fourths of all the college books, with one fourth devoted to grammar, poetry, music, medicine, arithmetic, geometry, and astronomy. The proportion was not materially altered in colonial New England, but in the Southern colonies private libraries reflected a later and broader taste.

Great Libraries Founded in Early Modern Period. — The Vatican library at Rome has historic origins in church records dating from the second century, and was associated in the fourth and fifth centuries with Popes Damasus and Hilary. With Boniface VIII, a true pontifical library began, when he ordered a catalogue to be made in 1295. These books were scattered in the fourteenth century, some going to Assisi, where they may still be seen. Nicholas V (1447–1455) was a book lover, collecting for the common convenience of all learned men; and fifteen years later Sixtus IV provided a building for the new collection, appointed Platina as librarian, and made the modern Vatican library a reality. From 1475 to the time of his death in 1481, Bartolommeo Platina fitted his library with banchi and wall cases, added paintings by Ghirlandajo and Melozzo da Forli, and catalogued the books. There were the Latin and Greek rooms, the *Bibliotheca Secreta* and the *Bibliotheca Pontificia*. Platina and his three pages slept in an adjoining room.

Juniper was used to fumigate, fox tails to dust, and brooms to sweep the library. A notice of the time of Julius II asked readers not to quarrel nor to jump over the desks. A pleasant description of the library will be found in Montaigne's *Travels in Italy* in 1581. Scholars were first admitted in 1888. Much might be said of the Laurentian library at Florence and of the origin of old collections in other parts of Europe. The familiar print by Woudanus in 1610 of the library of Leyden University represents gentlemen with their hats and cloaks on, followed by dogs, going from case to case to consult the chained books.

Edwards, in his *Memoirs of Libraries*, has given the story of the plundering of monastic libraries in the sixteenth century, when manuscripts were used to light candlesticks, to rub boots, and to wrap grocers' bundles, " and some they sent over sea to the bookbinders, not in small number, but at times whole ships full, to the wondering of the foreign nations." Books are still found with pieces of written parchment used in the bindings. In some college libraries the desks were sold since no books remained.

A century later a great need stimulated renewed interest in book collecting. Humphrey Chetham in 1651 saw the value of " godly English books, proper for the edification of the common people," and founded chapel libraries and a town library in Manchester. The Reverend Thomas Bray, whose life was one of amazing energy and results, promoted deanery and parish libraries all over England and parish libraries in the English colonies to preserve the clergy from ignorance.

The British Museum had its origin not as a hall of official records, but in three great collections illustrating English history. The death of Sir Hans Sloane in 1753 brought about the act (26 Geo. II, 1753) for the purchase of his treasures of art and books, together with the Harleian manuscripts, the two collections to be united with the Cottonian manuscripts, already the property of the nation, under a board of trustees. The British Museum was opened as Montague House in 1759, the Royal Library of the Kings having meanwhile been given by George II. The romantic career of the late Sir Anthony Panizzi, Italian refugee, librarian and scholar, resulted in placing the British Museum in the front rank. " He governed his library as his friend Cavour governed his country," wrote Dr. Garnett, " perfecting its internal organization with one hand while he extended its frontiers with the other." The printed catalogue, from troubled beginnings in 1834, is now complete, and represents a great bibliographical achievement, closing with the year 1900. Of earlier origin, the Bodleian library at Oxford, opened in 1602, was the first " public " library in Europe; the second was that of Angelo Rocca, opened at Rome in 1604. The John Rylands Library at Manchester, begun in 1890, took high rank two years later when the ancient Althorp Library of the Earls Spencer was purchased. This collection, associated with the genius of Dibdin, illustrated by examples the whole range of the history of printing.

The Bibliothèque Nationale in Paris can be traced to a collection of records in the Louvre in the time of Charles V. Guillaume Budé was the first *Maître de la Librairie du Roi* in 1544, and in 1556 a copy of each book printed in the country " with privilege " was by law deposited in the library. For several centuries two library families, the De Thous and the Bignons, held a sway of varying power, building up the collection by unceasing labor and foresight. In 1721 the books were removed to the Palais Mazarin, the Bignons serving as librarians from father to son from 1642 to 1784. The revolution sent its spoils of churches and country houses, swelling the accumulations of centuries to a total of nearly three million volumes. A catalogue is now (1912) being printed.

All the important countries of Europe have royal or national libraries, varying in size and administrative efficiency. The Imperial Library at St. Petersburg, with over a million volumes, is one of the most valuable in the world, and is freely open to scholars. In most cases, however, the great libraries of the continent are the accumulation of time rather than of systematic effort; and from them down to the humblest civic collection there is rarely any liberal control comparable to that which is everywhere characteristic of American libraries.

America. — For two centuries at least after the arrival of Winthrop in Massachusetts Bay, Boston was the literary center of the English colonies. Her clergy and her civic rulers could not be content without writing as well as reading books. A library established in the Town House at Boston through the will of Captain Robert Keayne, dated in 1653, was composed of books in English, and the idea may have been suggested by the small municipal collections formed at the English Norwich and elsewhere as early as 1608. New York owes its advent into library history to Reverend John Sharpe, chaplain at the fort, who proposed in 1712–1713 a public school, a public library, and a catechizing chapel. The library was to be free to all. Sharpe's books, and those of the corporation library of 1728, sent over by the Society for the Propagation of the Gospel, together with the much finer collections of the New York Society Library, founded in 1754, were all swept away during the Revolution.

Franklin once said that in his boyhood there was not one good bookstore south of Boston. When a lad, he went to Philadelphia and projected there in 1731 the first subscription library in the colonies. Franklin says: " I set on foot my first project of a public nature, that for a subscription library. . . . I was not able, with great industry, to find more than fifty persons, mostly young tradesmen, willing to pay down for this purpose forty shillings each, and ten shillings per annum. On this little fund we began." This collection eventually became the Philadelphia Library Society, and half a century later was strengthened by adding the Loganian library, which had been founded in 1745 through the generosity of James Logan, famous as the secretary of William Penn. The Redwood Library, established in Newport, R. I., in 1747, belongs to this period. A similar library, also an institution for self-improvement, was begun in the following year by some seventeen young men of Charleston, S. C.

As early as 1774 the *Connecticut Courant* made the assertion that the need of public libraries was " too manifest to be denied "; but up to 1850 the public library had no such character as it has to-day. It is true that Boston and New York made spasmodic attempts at city libraries, but in reality the only libraries during this time were the Bray or parish libraries, mostly unused, and the subscription libraries, which flourished because they were near by and were not necessarily self-sustaining.

The first ten years of the nineteenth century, influenced by the conditions in France, show a great intellectual awakening. Clubs of all kinds, and especially learned clubs, sprang up, and almost all had a reading room or a library. From this beginning many athenæums or scholars' libraries came into being, from New England to Georgia.

During this same period the establishment of state and national libraries was begun: New Hampshire, the pioneer, had a colonial library as early as 1770, which was reëstablished as a state library in 1818. New Jersey followed with a library as early as 1796, though it was so much broader in scope that it has served as a type to guide many later state libraries. It was a sufficiently elastic model to allow for the changes which time and varying conditions have imposed, enlarging the original conception into a far wider idea of its duty to the people, than that of a merely legislative function. South Carolina, Pennsylvania, and New York, the best known of the early state libraries, were all founded before 1818. In 1800 the national government established a library. Its beginnings were so small that its first catalogue (1802) was hardly necessary. When the British took Washington in 1814, the library was burned, and twice since, in 1825 and 1851, fires have occurred. Jefferson's library was purchased in 1815, and was the first of many famous collections to be added. The Library of Congress now aids her libraries through printed catalogue cards, bibliographies, and other material.

All these were tendencies away from libraries which were under private control, and the tendency became more marked when towns like Salisbury in Connecticut (1803) and Peterborough in New Hampshire (1833) established libraries with town funds. These foreshadowed the true public library, but it was not until George Ticknor of Boston grasped the significance of the great benefit that would come when books were free to all, that the movement came to its fruition. The first convention of librarians was held in New York, Sept. 15–17, 1853. The fact that fifty-three delegates were present shows how great was the awakening, both among scholars and among librarians.

In 1848 William F. Poole printed a modest index to the many periodicals which had become useless and because of the impossibility of finding the material hidden there. This was the origin of Poole's *Index.* At about the same time other men came into prominence in the library world, which at this time centered around Boston. Jewett failed to create a National Library, came to the Boston Public Library (1855), and made himself widely known by his rules for cataloguing. Thirteen years later Justin Minor succeeded them. At this time Poole was about to go to Cincinnati, and Cutter prepared to succeed him as librarian of the Boston Athenæum. These men and many others met in Philadelphia in 1876 and founded the American Library Association, with the *Library Journal* as its organ.

Recent Development. — *Scientific Library Management.* — Edwards (*q.v.*), Panizzi, and Ewart (*q.v.*) in England, and the leaders in America laid the library world under a debt hard of comprehension in the present day of universal progress. Library devices of all kinds were being perfected and improved at this time on both sides of the Atlantic. New rules for cataloguing were being tried, and Dewey and Cutter were bringing to perfection their systems of classification. See LIBRARY CLASSIFICATION.

Women at this time had little connection with libraries, but this has grown greater as their sphere of activity has grown wider. Mrs. Anne Waddell, a woman of affairs in New York, was named in the charter of the New York Society Library in 1772. During the first half of the nineteenth century women's sole literary interests were such as might be derived from the circulating libraries in the stationers' or bakers' stores. A few very erudite scholars were allowed to use the libraries of general literature; but the general attitude of mind toward such use was reflected by Charles Folsom, who protested in 1855 against women having access to " the corrupter portions of the polite literature."

In 1850 Harvard had 68,000 volumes, the largest collection in America, the Library of Congress about 46,000, the New York Library Society 30,000, and the Library Company of Philadelphia 55,000, the second in size. To-day these would not seem large collections for any prosperous town.

The library movement in the United States is indebted to many forces for its success. The

Mathers, Prince, Sharpe, and others of the colonial clergy fostered the collection and care of books. Franklin, a great social and scientific factor in our development, emphasized the library as an aid to the skilled laborer. Following the American Revolution and its period of inaction, French ideals had an awakening impulse, caught up and carried on by the far-reaching lyceum system of rural lectures. No doubt also the articles by Edward Edwards and the speeches of Ewart had their echo on this side of the Atlantic. Certainly the *Report of the Commissioners*, appointed by the House of Commons to inquire into the constitution and government of the British Museum under Panizzi, and published in 1850, must have interested and aroused men interested in books, in administration, and in social forces.

Library Legislation. — An enlightened opinion has in some states forced special library legislation; but more often a few devoted men have obtained the laws that in time create a regard for libraries. The library law of New York, passed in 1835, under which a school district could raise a sum of money for the purchase of books, established the principle of taxation for the support of libraries. New Hampshire passed a very simple library law in 1849, with no limit as to appropriation and no conditions as to management. Massachusetts enacted in 1851 a brief law under which libraries multiplied rapidly in the commonwealth. Maine in 1854 passed an unsatisfactory law, permitting the levy of a dollar on each ratable poll to establish libraries, and twenty-five cents per poll for maintenance. Vermont did little better in 1865. The Ohio law of 1847 tied the library to the educational system. In 1872 Colorado passed a good law, and Illinois devised an elaborate and thoroughly satisfactory act which has influenced many states, New Jersey, Wisconsin, Michigan, California, Missouri, and others. Some sections of the country were for a long time very backward in library legislation, including Connecticut, Pennsylvania, and even New York, where the fairly convenient school district system was not altered till 1892.

The State Library Commission, which was established by Massachusetts in 1890 to foster town libraries, set an example that has been followed throughout the country; with increasing powers and a firmer conviction of the work to be accomplished, state commissions have grown in importance and in the scope of their work for library extension. In many states the coöperation of the state commission and the state library has made the use of books a vital and far-reaching force for intelligent citizenship.

Library history in the United States has been of short duration, but, with no traditions to forget and no customs to break, progress has been rapid. History, as far as it has been made, has had less of the dignity of mere age and more of the fruit of radical achievement. One has only to study library history in France, Germany, or Italy, to realize that what has been done in the United States toward establishing an intimate relationship between good books and the social life of all classes has been pioneer work.

Free Public Libraries. — Library progress in the sociological sense must be studied in three sections. England, although handicapped by inability to free her library and museum property from taxation, began before 1850, under able leaders, her campaign for free libraries. America, recognizing early the right to levy taxes for the establishment and maintenance of public libraries, made greater progress along seemingly radical lines. The Continent, crippled by social and economic conditions, has only very recently welcomed modern ideals.

In 1700 John Evelyn said that Paris had more libraries than were in the three kingdoms of Great Britain, and Gibbon declared in 1800 that no scholarly work could be done in English libraries. A conference at Manchester half a century later agreed that since Gibbon's day little improvement had been made, and William Ewart was asked to begin a parliamentary fight for a library law. The bill of 1845 " for encouraging the establishment of *museums* in large towns " was passed; it allowed half a penny in the pound to be levied for land and buildings for museums in large towns, but no specimens or books could be bought. Edward Edwards, for many years on the staff of the British Museum, took up the study of library conditions at home, on the Continent, and in the United States, embodying his researches in articles published in 1847 and 1848. Ewart then brought in a bill, which met with vigorous opposition and the most absurd arguments before its passage in 1850. This act was permissive for towns of 10,000 inhabitants and over, kept to the same inadequate rate, and made no provision for the purchase of books; but it was distinctly for libraries as well as for museums, although the latter have always overshadowed public libraries in English legislation. Subsequent acts advanced the rate to a penny, allowed the purchase of books and newspapers, permitted money to be borrowed for the erection of buildings, and extended these privileges to Scotland and Ireland. So great was the confusion arising from conflicting library acts that in 1894 they were consolidated, making a nearly uniform law for the United Kingdom.

The rate limit has hindered library progress, and taxation of library property has still further decreased the net return from a rate already too small for healthy growth in populous communities. London, with no central government until 1899, has had a slow development. English libraries in early days depended too much on mechanical devices; the librarian was a custodian and clerk rather than an administrator, and his influence was limited. Until recently there have been no training schools for young men and women who fill the minor places, so that these have been less intelligently managed than large libraries which could tempt officials from the British Museum. An American is apt to think that the English librarian does not trust his public enough, that he does not do enough for schools, for rural districts, and in the way of coöperation with neighboring libraries. The Englishman considers our classification on the shelves too close and too inflexible, and he experiments cautiously with the many social plans by which Americans bind the community to the public library.

In America Ticknor set the pace for library progress when, in 1851, he spoke of his aim for the proposed public library in Boston: " I would establish a, library which differs from all free libraries yet attempted; I mean one in which any popular books, tending to moral and intellectual improvement, shall be furnished in such numbers of copies that many persons can be reading the same book at the same time; in short, that not only the best books of all sorts, but the pleasant literature of the day, shall be made accessible to the whole people when they most care for it, that is, when it is fresh and new."

But even in America the free public library has come with wise slowness into favor. As late as 1876, when one hundred and three delegates met at a conference of American librarians, only fourteen represented institutions of the modern free public library type. Libraries maintained by shareholders and by annual subscribers still predominated. With the rapid advance of the free library the scope of its work along social lines has become a subject for debate. We are not far from that condition referred to in 1850 by a member of Parliament who prophesied that the working classes would soon be asking for "quoits, peg-tops, and footballs." Sunday opening, first tried in Cincinnati in 1870, was an early step in the radical movement in America. Work with children, now recognized as essential in a good library, attempts to attract and hold the young when they first learn to read. Indeed, story telling and games are introduced in branches of great city libraries to win the very young and the foreign born. University extension lectures, given on certain evenings each week and on Sundays, bring older people to the building and give them predigested treasures from books and art. More liberal rules for the circulation of books (the two-book system and special cards for teachers), free access to the shelves or to special standard collections, and even free delivery from library to home, all illustrate the endeavor to make the free library indispensable.

A distinct effort is now made to educate taste in architecture by new ideals of excellence in buildings; but the façade follows the plan and is not merely a pleasing exterior. Books on library planning fortify the librarian against the inexperienced architect who desires effect only.

Library Methods. — The American missionary spirit, radical though it may be, has had its influence in the old world as well as in the conservative communities of the new. Certain mechanical improvements, such as the decimal and expansive systems of classification for placing books on the shelves, indexing the books of the library on cards instead of in ledgers, making a charging record for books taken out of the building so that statistical information may easily be compiled, and uniform cataloguing rules, adopted in preparing cards to be issued by the Library of Congress, are revolutionizing the routine of library administration. The librarian, while he may still be a " missionary of culture," must recognize that his vocation calls for business ability.

English and American methods, though differing, are not fundamentally divergent after all. The Continent, however, can show little enlightened library development outside a few isolated examples in Holland, Switzerland, Germany, and Sweden. In Germany the dual library system, a *Stadtbibliothek*, or sleepy municipal library in the main street, and a *Volksbibliothek* or cheap fiction library on the side street, has delayed the coming of the all-round large public library. Social club libraries also have satisfied the more intelligent members of the community, who are bound together by a love for art, music, archæology, or science.

France has few cities where the public seem to want libraries, and zeal is not expected from poorly paid librarians. The scholarly librarian, however, still survives in some historic French towns. What France lacks in organization Italy carries almost to an extreme. A library assistant in Italy can be transferred from city to suburb or to a distant city, finding the same system everywhere. In the northern countries of Europe people's libraries are still parish charities, except where Miss Valfrid Palmgren, through addresses and writings, has introduced American methods and aims. The censorship in Russia has crushed library progress there, and throughout many square miles no books are accessible to the public. The works of a contemporary poet under the ban of the censor could not be found in a library which honored him by bearing his name. Still, in Russia, and in Siberia, interesting little libraries may be found where a librarian has been born for the task, undismayed by conditions which prevail all about him.

Germany and Switzerland have attempted catalogues on a great scale; but in most European capitals the catalogues are inaccessible, or inadequate, and the service is very slow. Munich, Stockholm, and Brussels have been famed in the past for helpful employees and convenient appliances; but administrators die and policies change. The real library movement is to be seen at Charlottenburg and Essen in Germany, at Dordrecht and Groningen in Holland, at Stockholm, and at several other places where modern methods are but just coming into vogue. Foreign scholars have attended English and American library conferences, and have admired what they saw, but they have been slow to believe that these radical methods could be made successful in Continental cities. They are, however, very gradually making the experiment. C. K. B.

School Libraries. — *District School Libraries.* — The district school library movement antedated the modern public library movement in this country by about forty years. Its original impulse came from educators who saw that if the State was to gain intelligent citizens, as a result of its investment in education, the young must not only be taught reading, but must be given good books to read.

New York was the pioneer, and a law was passed in 1835 permitting the voters of any school district to levy a tax of $20 to start a library, and $10 annually to maintain it. This permission failing to appeal to the rural taxpayer, the legislature of 1838 passed a law appropriating $55,000 annually for the establishment of libraries in every school district of the state, with the provision that after three years the money might be spent for books or for teachers' wages, at the discretion of the district. These were not to be strictly school libraries for the use of the pupils alone, but were also intended for the use of the people of the district.

The example of New York was followed by Massachusetts, which, through the efforts of Horace Mann (*q.v.*), passed in 1835 a permissive school district law, and in 1842 added the stimulus of a state appropriation of $15 to each district that should raise an equal amount.

Following the lead of New York and Massachusetts, seventeen states passed more or less effective laws providing for district school libraries, as follows: Connecticut, 1839; Rhode Island and Iowa, 1840; Indiana, 1841; Maine, 1844; Ohio, 1847; Wisconsin, 1848; Missouri, 1853; California and Oregon, 1854; Illinois, 1855; Kansas and Virginia, 1870; New Jersey, 1871; Kentucky and Minnesota, 1873; and Colorado, 1876.

The results of this legislation were in the main disappointing. Jewett's Notices of public libraries in the United States, published by the Smithsonian Institution in 1851, reports 9505 public school libraries in all, containing 1,522,332 volumes, of which 1,338,848 volumes were in New York, 91,539 in Massachusetts, 47,220 in Michigan, and 19,637 in Rhode Island; no other state reporting more than 10,000. In the Bureau of Education's special report on libraries in 1876 the total number of volumes in school libraries had declined to 1,365,407. In New York State, where alone the school libraries were very generally established, the number of volumes in libraries fell from over 1,300,000 in 1851 to 825,000 in 1892, and most of the annual appropriation had come to be devoted to general school purposes.

Success of the Movement. — Two reasons are usually assigned for the comparative failure of the school library movement in the country. First, defects in legislation; many of the states failed to give state aid or gave it only intermittently or failed to provide for the supplementing of state aid by local taxation, thereby keeping up local interest in the libraries. Second, defects of administration; there was seldom any supervision over the selection of books, and the local school authorities were not accountable to any central authority for the management of the libraries. But underlying both of these reasons was the fact that this early school library movement was strictly a school enterprise. The educators originating it did not realize that books alone do not make a library, and that only where organized into libraries do masses of books become available for use. To be efficient a library should be well chosen, classified by subject, the contents of the books brought out by analytical cataloguing. The books need to be mended and rebound; they should be charged when in circulation, both for safety and in order that their use may be recorded. All this is a librarian's business, not a teacher's; and in the forties and fifties librarians themselves had not yet worked out methods of efficient library administration, — library science was in its infancy.

American librarianship did not become an organized profession until 1876. By that time the great increase in the number and size of libraries in the country (from 694 libraries with 2,201,632 volumes in 1851 to 3647 libraries with 12,276,964 volumes in 1876, exclusive of school libraries) had forced librarians to create more uniform, economic, and efficient methods of administration, and for the first ten or fifteen years the sessions of the American Library Association were largely devoted to questions of library technique, — cataloguing, classification, charging systems, shelving, etc. Very dry and uninspiring subjects, but thanks to the fine quality of thinking expended on them and to the *esprit de corps* that put every improvement at the disposal of the whole profession, these problems were solved so successfully that the enormous expansion in the number and size of libraries during the last twenty-five years was accomplished easily and has been accompanied by an even greater expansion of use. According to the Bureau of Education *Reports* there were in 1884, 2988 libraries of over 1000 volumes in the United States, containing in all 12,376,473 volumes, with a total circulation of 10,899,469; in 1908 there were 5640 libraries, with 62,628,541 volumes and a circulation of 82,222,584. In other words, while the libraries have doubled in number, their size has multiplied by five, and their use has increased nearly eightfold.

With problems of library administration in a fair way to be settled, librarians next turned their attention to improving the quality of books in the libraries. Principles of book selection were evolved, and bibliographic tools for the evaluation and selection of books were forged, a partial list of which will be found appended. With these methods and tools librarians were now equipped to aid educators in their endeavor to make the school libraries a dynamic element in education.

In 1888 Melvil Dewey, who had perhaps done more than any other man to promote administrative efficiency in American libraries, was made State Librarian of New York; and thus the organizing genius of the new librarianship was brought to bear on the unsatisfactory conditions of district school libraries. Mr. Dewey found that the $55,000 still appropriated under the law of 1838 had been almost wholly diverted to general school purposes; that in many cases the libraries had been dispersed, and that where they survived, the original purpose of supplying books to the people of the school district had been lost sight of, and that the books were regarded as part of the school equipment. A new law drawn up by Mr. Dewey transferred those that had developed into public libraries to the regents of the university, to be carried on in connection with the state library, while the appropriation of $55,000 (subsequently increased to $100,000) was continued, but it was specifically directed that it be administered by the Department of Public Instruction for pedagogic and reference books for the use of the teachers and pupils. That rule, however, was annulled in 1910, and school libraries in communities that have no public libraries may be opened to the public. Since 1892 the number of volumes in the school libraries has increased from about 800,000 to 3,135,408 volumes, selected from lists approved by the state authorities and bearing on the state course of study. The state education department reports that the libraries are well cared for; that in some cases the librarian of the local public library supervises the school library, and that in many cases there are trained librarians in charge of the school libraries.

State commissions to stimulate the establishment and to advance the efficiency of libraries have been established in thirty-three states, beginning with Massachusetts in 1891, and in many states the school libraries have come under their influence. In Illinois the library commission lends books to county school libraries; in Minnesota the relation between the commission and the schools is very close, — the commission organizes school libraries and revises the list from which purchases must be made, the state superintendent of education employing a member of the commission's staff to care for school books. In Missouri and Nebraska the state library commissions are also in touch with the district school libraries. In Connecticut the State Library Committee (Commission) is directed by law to assist in the selection, purchase, and administration of school libraries and to lend them books and pictures. In Oregon the library commission is directly responsible for the district school libraries. A mandatory tax of not less than ten cents per capita for each child of school age shall be levied by each county having less than 100,000 inhabitants and set aside for school libraries. This is apportioned by the county superintendent, who must report to the Oregon Library Commission the amount apportioned to each district and the number of school children in each district. During July of each year the local school authorities must select from lists prepared and furnished by the library commission such books as are desirable for their district, the aggregate mailing price of which shall not exceed the apportionment. This list must be sent to the library commission by Aug. 10, and the commission buys the books, thus receiving much larger discounts than each library purchasing separately could obtain. If the lists from any districts fail to be received by Aug. 10, the commission shall select the books for these districts. The county superintendent shall appoint a librarian who shall receive and have the care and custody of the books, and shall loan them to the teachers, pupils, and other residents of the district in accordance with regulations prescribed by the commission. When school is in session the library shall be placed in the schoolhouse, and the teachers shall be responsible for its proper care and protection.

A revival of effort to increase the number and improve the efficiency of public school libraries, due in part at least to direct or indirect stimulus from library sources, is felt all over the country and has been reflected in recent legislation. Only eight states (Arkansas, Georgia, Mississippi, New Hampshire, Tennessee, Texas, Vermont, West Virginia) have no school library system established by law.

An analysis of existing laws shows that they fall into three classes, — permissive laws, in which the district is allowed to tax itself for a school library; persuasive laws, in which the state grants aid to the district, usually duplicating the amount raised by the district; and mandatory, in which the establishment of school libraries is required, part of the school funds being set aside for the purpose, and some state official or body, superintendent of schools, or library commission being made responsible for the enforcement of the law.

Only the exceptionally energetic school authorities or progressive communities avail themselves of the privileges granted by a permissive law. When the inducement of state aid is added, the moderately energetic and intelligent will take advantage of it; but a mandatory law, the execution of which is intrusted to state authority, will overcome the inertia of the great mass, and will achieve the desired result of a well selected library in every public school in the country.

The essential points to be covered by a good school law are: — (1) A mandatory minimum annual tax levy by county. (2) Compulsory selection from a well chosen list made by some recognized and responsible authority. (3) A central purchasing agency and a state contract price. (4) A definite and fixed time for annual purchase. (5) Suitable rules and regulations to prevent scattering of the books.

The Oregon law described on page 15 is especially to be commended as providing all these requirements. A brief résumé of the laws relating to state aid for public school libraries will be found in *Library Journal*, Vol. XXXVII, 1912, pp. 312–315.

School Libraries in Towns and Cities. — School library legislation has in the main concerned itself with the problem of the country school, while library work in city schools has largely developed along the lines of coöperation between the public library and the schools.

To-day practically all of the public library systems in the cities of the United States have organized school departments through which classroom libraries are placed in the schools. In Buffalo the public library has placed 828 libraries in the grammar schools of the city, from which 418,753 volumes were circulated in 1910. In St. Louis traveling libraries are sent to the grade schools. In 1911, 176 traveling libraries containing in all 101,759 volumes, were sent to schools, and deposit stations are established in ten school buildings in which 59,238 volumes are placed. The Cleveland Public Library appointed a supervisor of classroom libraries in 1906, and the use of classroom libraries is being developed as rapidly as the resources of the library will permit. Detroit sends books for supplementary reading to the schools, circulating 77,869 volumes to school children in 1910. In Pittsburgh a catalogue of books for the use of pupils of the first eight grades was published in 1902 by a committee of teachers and librarians. A second, revised edition was published in 1907. Books are sent to 108 schools; about 100,000 volumes are circulated for home use yearly, and nearly twice that number used in the classrooms. The Newark Public Library has a school department, maintains a reference room containing books and periodicals for the use of teachers, and sends about 500 traveling libraries to classrooms.

The State Board of Education of New Jersey decided in 1911 that in all communities having free public libraries the board would recommend, subject to the approval of the local board of education, that the school library be administered by the public library, the circulating books, both fiction and nonfiction, becoming part of the working collection of the public library, with a distinguishing label, "Bought from the school library fund"; the pedagogical and strictly reference books are to be left in the school buildings where desired. The public library, on the other hand, must agree to furnish such books to the schools as may be needed in school work.

In New York City the work of supplying classroom libraries is carried on by the board of education. This work began in 1893 before the consolidation of the several privately endowed and maintained libraries of the city into the present efficient public library system. In 1903 the board appointed the head of school work in the Buffalo Public Library as superintendent of school libraries of New York City. There are in 1911 more than 12,000 classroom libraries in the system, containing from thirty to forty books each, and with a circulation of about 8,000,000 volumes a year. There are also teachers' reference libraries in each school building.

The New York and Brooklyn Public Libraries supplement these school libraries by sending traveling libraries to the schools on request, and the New York Public Library has a school department which promotes reference work with the schools in the neighborhood of each branch of the library.

High School Libraries. — In an article in *School Review* (Vol. XIV, p. 762) it is stated that "In every city school building there should be set apart as a library one large room furnished with comfortable chairs, in which should be found daily papers, suitable magazines, a liberal supply of the best fiction, travel, popular science, live, unabridged historical narrative, biographical essays. A modern card catalogue should be provided, which the students should be taught to use." A trained librarian to make the catalogue and to teach the use of it, as well as to stimulate the use of the books themselves, is needed to complete this picture. How many high schools of the country have established such libraries cannot be stated. The last Bureau of Education statistical report on libraries gives the number of school libraries in the country having over 1000 volumes as 1644, but private schools and the larger public school libraries are included.

In New York State there were in 1909 fifty-three high school libraries, established within the last twenty years, thirty of which are for the exclusive use of the schools; nine of them are for all grades, though housed in high school buildings, and fourteen of them combine the functions of high school and public libraries. Twenty-five of these libraries are in charge of librarians having previous library training or experience. A very important function of the high school librarian is that of giving instruction to the pupils in the use of the library, catalogue, indexes, and reference books. This is done systematically in several high schools in New York State, and the committee on high school libraries of the New York Library Association has been bringing the matter to the attention of high school principals. It has been done for some years in the Detroit Central High School; in other high schools, as at Newark, this instruction is given by the English teachers aided by the public library. In Cleveland the high school libraries are under the charge of the public library. The schools furnish equipment and reference books, the library the librarian and a permanent circulating collection, and, in addition, lends books as needed, a regular delivery schedule being maintained between the high school libraries and the public library. Instruction in the use of books, based on a manual prepared by the supervisor of high school branches, is given regularly in all the high school libraries, for which credit is given in English.

Library Training in Normal Schools. — Most school libraries depend for their efficiency on the teacher, who must not only acquire enough knowledge of library economy to arrange, care for, and record the use of the books, but who should be able to guide the reading of the children and also to make the books contribute their utmost toward the enrichment of the school work. In order to attain this end, normal school students must be trained in the care and use of books and given some critical knowledge of children's books.

In a report of a subcommittee of the National Council of the N. E. A. on the relation of libraries to normal schools, in 1899, the question was asked if "the professional training of teachers had not reached that period in its development where the library must be one of the chief factors in the training of pupil teachers?" No mention was made in the report of any definite course in library training being given by a normal school, but an affirmative response was made to the query shortly after by the announcement of library courses by normal schools in different parts of the country. In 1902 a trained librarian was engaged by the Cleveland Normal School to give a course in "library use." In 1903 a study of juvenile literature was added to it. The course occupies three periods a week for three terms, is on the same basis of credit as other regular courses, and is required for graduation.

The Normal School at Whitewater, Wis., publishes a helpful outline of the work given there. The N. E. A. published in the *Proceedings* for 1906, and as a separate pamphlet (now out of print), a report on the subject which outlined a rather elaborate scheme of library instruction.

In several cities, Omaha, Neb., Newark, N.J., and Dayton, Ohio, among them, instruction of normal school students in library work has been carried on by the public library.

A number of state normal schools have given courses in library economy in connection with their summer schools, and in Michigan instruction in library work has been given at teachers' institutes.

Branch Libraries in Schools. — The movement to increase and to socialize the use of school buildings is of great interest to librarians and suggests the desirability of placing branches of public libraries in school buildings, more generally than has been done heretofore. This has already been started in Newark, N.J., and it has been carried on successfully for several years past in Grand Rapids, Mich., where through coöperation between the Board of Education and the library regular branches of the library have been housed in the school buildings. These are conducted as public, not as school libraries, being open from 12.30 to 9 P.M., and containing books for readers of all ages. The superintendent of schools said recently that the greatest educational advance in recent years was the establishment of branch libraries in the public schools, as the presence of a library and a librarian added greatly to the efficiency of the general school work.

Canada. — The district school library movement started in New York in 1835 and spread into Ontario, where an act was passed in 1850 providing for school libraries managed by local authorities under regulations prepared by the Council of Public Instruction. In accordance with the law, a classified catalogue was prepared by the Council from which alone selection could be made. The books were purchased by the Council, and, in addition, books to the value of the amount raised by the locality were given by the Council to each library. A record of each library was kept by the department and of the books furnished to it, thus preventing duplication. This law was much more enlightened than most of the corresponding legislation in the United States, and its results have been satisfactory.

England. — Sonnenschein's *Cyclopædia of Education*, 1906, states that in Great Britain any attempt at the formation of elementary and secondary school libraries has been due chiefly to purely voluntary effort, no assistance being given by the State. School libraries are not mentioned in the Educational Act of 1902. In an article in the *Library World* (1905–1906, p. 173) it is stated that about 9000 schools out of 12,000 are provided with libraries, the management of which varies in different localities. The larger number are entirely under the control of the individual education committees, while some are managed by a joint education and library committee. The public libraries of Great Britain have been too much hampered by restrictive legislation limiting the amount that could be raised by rates for library support to carry on work for schools like that done in the United States. A beginning, however, was made at Cardiff, Wales, in 1899. The school board raised the money, and the library committee undertook to administer the libraries, a joint committee of management being appointed from the two bodies. This has worked very successfully. The example has been followed by several other localities, and it indicates the line along which school libraries are likely to develop in the United Kingdom.

In London in 1908 a scheme was adopted by the County Council by which any public elementary school may be supplied with a small permanent library upon an application to the libraries' committee by the headmaster or trustees, who must give surety to the Council for the safe custody of the books. A list of 200 books will be sent to the applicant with a recommendation that books be selected from it.

France. — The idea of placing libraries in the schools dates back to the era of the Revolution; the *Décret sur l'organization des écoles primaires, 12 Déc. 1792,* directed that there should be formed in each school a small collection of books for the use of the pupils, and that it should be put in the care of an *Instituteur.* All the subsequent laws relative to elementary education recognized the importance of school libraries and dealt with means of introducing them into the schools. Successive ministries ordered the distribution of books to the schools, and between 1833 and 1848 more than a million volumes were distributed. But the indifference of the teachers and the laxity of supervision worked even more disastrously in France than in America, and in 1850 the school libraries had completely disappeared. (Buisson's *Dictionnaire de Pédagogie,* s.v. *Bibliothèques,* 1911 ed.)

In 1862 the ministry issued an order directing the establishment of school libraries in every public school for boys, and ordering the books to be placed in a bookcase in a schoolroom under the care of an instructor. No commune would receive books from the government unless it complied with this regulation. The State has since continued its gifts of books to school libraries, the volumes comprising both works necessary to the classroom work and instructive reading for the scholars and for adult members of their families. A special commission was created in 1865 to pass upon the books to be bought for school libraries; this commission, *Le Comité des bibliothèques de l'enseignement primaire,* issues catalogues of approved books from time to time.

The development of school libraries has been continuous since 1862. There are now in the neighborhood of 50,000 libraries, containing an average of 160 volumes in each; the regulations are definite, and the libraries are a branch of the public service.

Germany. — There is no general school library law in Germany, and but little mention of school libraries in the educational legislation of the separate states. Württemberg and Saxony have recognized them, but the laws are vague and merely suggestive, and have not had much influence. So, while there are libraries in most of the higher schools and in many public schools, the school library has not the legal status in Germany that it has in France or Austria. The existing school libraries are in general for the use of teachers and pupils, and are not for popular use, as in France, though in country districts the public and school libraries are sometimes combined.

Austria. — The Minister of Religion and Education issued an order in 1870 that a library should be established in every communal school; regulations for the organization of the libraries were promulgated in 1871 and completed in 1875. The director of the school is to be responsible for the library, which is not only intended for the scholars, but for the people of the commune. The government has not given the school library movement the systematic support which it has received in France, and there are no general statistics of the number of school libraries obtainable; but there has been much general interest in the subject, and private efforts have been organized to extend and improve school libraries.

School libraries for pupils and their families are also found in Sweden, Switzerland, and Belgium.

Italy. — The government has done nothing for school libraries, but at a library conference in Milan in 1906 it was reported that a national society had been organized with headquarters in Ferrara to promote the establishment of school libraries. Through the efforts of the society the schools of Ferrara and Leghorn had been provided with libraries, and the movement was extending to Pisa, Turin, San Remo, Florence, and elsewhere. The society is doing much, but it cannot take the place of state action, and until that is forthcoming Italy will be far behind its neighbors.

Spain. — School libraries were created in Spain by government decree in 1869. In 1878 the government purchased 100,000 volumes for distribution to school libraries, but it seemed to consider the work done for all time, as no provision was made for subsequent additions.

J. A. R.

Pedagogical Libraries. — Pedagogical libraries in the United States have developed in connection with national, state, and city bureaus of education, state and city libraries, universities, and normal schools.

The U. S. Bureau of Education at Washington, D.C., established in 1867, has collected a pedagogical library of more than 100,000 volumes. In certain classes of educational literature, such as state and city school reports, laws, etc., catalogues and reports of universities, colleges, and schools, files of educational periodicals, and transactions of educational associations, the library is probably the most complete in the country. It has also a large collection of school and college textbooks. While primarily a library for the use of the bureau staff, it is designed to serve also as a central reference and circulating library for educators throughout the country. Books may be borrowed as interlibrary loans, or upon the guarantee of a responsible school official, or of a personal deposit, and are transmitted to the borrower free of charge. The library also supplies bibliographical information on educational subjects through its printed publications and correspondence. Its most significant publications are the *Monthly Record of Current Educational Publications* (No. 1, Jan. 15, 1912), cumulated in the annual *Bibliography of Education,* which now covers the period since 1907, and *A Teacher's Professional Library. Classified List of 100 titles.* (Washington, 1909.) Upon request the library also supplies lists of books and magazine articles on special educational questions. The bibliographical equipment of the library consists of a union catalogue of educational literature in the government libraries at Washington in card form, an extensive card index to the contents of current official reports, society publications, and periodicals relating to education, and a file of reference lists in typewritten manuscript form. (W. · D. Johnston. The Library of the Bureau of Education. *Educational Review,* Vol. XXXVI, pp. 452–457, December, 1908. E. D. Greenman. The bibliographic Work of the U. S. Bureau of Education. *Library Journal,* Vol. XXXVI, pp. 180–181, April, 1911.)

The state pedagogical libraries are identified with either the state department of education, the state library, or the state university. Those of the first class are ordinarily mere office libraries; but two significant exceptions may be noted, that of the New York Department of Instruction, established in 1895, the purpose of which was the circulation of professional and related literature among school officials and teachers throughout the state, and that of the Rhode Island Department of Education, which sought instead to promote the establishment of local collections and with this in view published a periodical *Library Bulletin* (1908).

The New York Education Department library was in 1904 transferred to the state library. In other states, too, the facilities of a general library for the care and distribution of books have led to the development of a pedagogical department of the state library and the circulation of traveling libraries for teachers either by the state library or state library commission. The state universities on the other hand have superior resources for the bibliographical work pertaining to such service.

In California (1889) and New Jersey (1891) county libraries for teachers were established. In each case, however, the tendency has been to merge this special service with the general, and especially to make use of the library resources and equipment of the largest county town.

The first city to establish a pedagogical library was Philadelphia. This library, founded in 1883 upon the accession of Dr. James MacAlister to the office of superintendent of schools, published a catalogue of its collections in 1887, and again in 1907 (525 pp.). This library still remains distinct from the public library service of the city; but in most other cities, as in most states, the special library service has either been transferred to the general library or in some measure made a part of it. In Cleveland, for example, the board of education published in 1892 *Courses of professional reading for teachers and catalogue of pedagogical and reference books of the Free Public Library.* In Providence, on the other hand, it was the public library which first published a catalogue of local collections of pedagogical literature, issuing first a list of books in its own collections (*Monthly Bulletin,* May, 1897), and a year later a catalogue of the public school library at the office of the superintendent of schools. The only other local bibliographical work of significance for teachers is that done by public libraries, examples of which are the *List of textbooks in the Boston Public Library, Monthly Bulletin,* September, 1900, and the *Check list of works relating to the schools and to the educational history of the city of New York in the New York Public Library,* published in its *Bulletin* for June, 1901.

Of university pedagogical libraries the earliest and the largest is that of Teachers College, Columbia University. This library, established in 1888, was in 1899 coördinated with the other libraries of the university, and in 1901 a catalogue entitled *Books on Education in the Libraries of Columbia University* (435 pp.) was published. The library now numbers 87,236 volumes and pamphlets, of which 65,336 relate to education. The latter are distributed as follows: history of education, including documents, 15,784; higher education, 21,807; secondary education, 5472; elementary education, 1104; training of teachers, 2734; textbooks, 6501; other classes, 11,336.

The libraries reported by 185 public normal schools in 1910 contained 1,331,705 volumes, an average of 7198 volumes each. The largest library, that of the Indiana state normal school, Terre Haute, contained 50,000 volumes. Fifty-seven private normal schools reported 189,823 volumes, an average of 3330 volumes each.

The principal pedagogical libraries in other countries are the *Pädagogische Central-Bibliothek* (*Comenius-Stiftung*), Leipzig, 152,216 volumes and pamphlets (*Katalog der pädagogischen Central-Bibliothek,* 2te Aufl. 1892–1897, 2 v.); the library of the *Musée Pédagogique,* Paris, 76,000 volumes (Catalogue, 1886–1889, 3 v.); and the library of the English Board of Education (25,000 volumes). W. D. J.

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Buisson, F. *Dictionnaire de Pédagogie*, s.v. *Bibliothèques Scolaires.*

Fabietti, E. *Manuale per le Bibliotheche Popolari.* (Milan, 1908.)

Pellisson, M. *Les Bibliothèques populaires à l' Étranger et en France.* (Paris, 1906.)

Pedagogical Libraries: —

Beeger, J. *Die pädagogischen Bibliotheken, Schulmuseen und ständigen Lehrmittelaustellungen der Welt.* (Leipzig, 1892.)

Greenman, E. D. The bibliographic Work of the U. S. Bureau of Education. *Library Journal*, Vol. XXXVI, pp. 180–181.

Johnston, W. D. The Library of the Bureau of Education. *Educ. Rev.* Vol. XXXVI, pp. 452–457.

LIBRARY CLASSIFICATION OF EDUCATIONAL PUBLICATIONS. — The system of classification of books on education commonly used in public and in some university and college libraries is the Dewey Decimal System. This classification is as follows:

370.	EDUCATION.
.1	Theory of education Meaning Aim
.109	History of educational theory
.15	Psychology applied to education
.3	Dictionaries Cyclopedias
.4	Essays Addresses
.5	Periodicals
.6	Organizations Conventions
.7	Study of education Institutions and organizations for training teachers
.71	Teachers' meetings
.72	Teachers' institutes
.73	Normal schools
.74	Educational museums
.9	History, description
.92	Educational biography
.93–99	History of education in special countries

371.	TEACHERS. METHODS. DISCIPLINE
.1	Teachers Teaching personnel Professors, masters, instructors
.11	Qualifications Personality
.13	Examination Certificates Certified teachers Licenses
.14	Appointment Organization of teaching force
.15	Professional status
.16	Salary and promotion Compensation Amount of service
.161	Salary
.165	Promotion Advance in rank
.2	School organization School records
.21	Admission Enrolment Matriculation
.212	Grammar or intermediate school admission standards
.213	High school standards
.214	College standards
.23	Terms Vacations Holidays Breaking up
.25	Classes Grades
.253	Length of school courses; *e.g.* year course
.27	Examinations: oral, written Cramming
.28	Promotions Degrading
.3	Methods of instruction
.32	Textbooks Recitations
.38	Laboratory work
.4	Systems of education
.421	Educational value
.43	Military organization Military instruction
.5	Government Discipline Authority
.52	Attendance Truancy Tardiness Absences
.53	Rewards Prizes Favors Approbation
.54	Punishment Disciplinary penalties
.6	School premises and equipment
.62	Buildings
.623	Laboratories Observatory Machine shop
.624	Gymnasium
.63	Furnishing and decoration
.631	Furniture
.64	Libraries
.648	Professional and technical school libraries
.65	Museums: character and functions
.66	Scientific apparatus, laboratory equipment and supplies
.7	School hygiene
.71	Health of students Overstudy Fatigue
.712	Medical inspection
.716	School meals
.73	Care of body Gymnastics Calisthenics
.732	Gymnastics Calisthenics
.74	Recreations Games, etc. Athletics Diversions
.8	Student life and customs
.87	Student houses Lodgings Dormitories
.9	Education of special classes
.91	Physically defective
.911	Blind
.912	Deaf
.913	Blind-deaf
.92	Physically defective
.93	Morally defective Delinquents
.94	Other abnormal classes
.945	Exceptionals
.947	Dependents
.974	Freedmen Negroes
.975	Indians

372.	ELEMENTARY EDUCATION
.2	Kindergarten
.3	Observing powers Object teaching Science
.4	Reading Alphabet Phonics and word methods
.5	Elementary writing and manual work
.6	Elementary grammar Language lessons
.7	Elementary Arithmetic
.8	Other studies
373.	SECONDARY ACADEMIC PREPARATORY
374.	HOME EDUCATION SELF-EDUCATION AND CULTURE
.4	Correspondence teaching Manuscript aids
.5	Lectures
.6	Extension courses Lecture study
.8	Continuation schools
375.	CURRICULUM
376.	EDUCATION OF WOMEN
.6	Higher education of women.
.7	Coeducation Segregation Separation
.8	Colleges for women
.9	Special countries and schools: history, reports, etc.
377.	RELIGIOUS, ETHICAL AND SECULAR EDUCATION
.1	Religious instruction Bible in public schools
.2	Ethical education
.8	Church and education
.9	Non-Christian religions and education
378.	COLLEGES AND UNIVERSITIES
.05	Academic periodicals
.06	General college associations
.1	Organization Government Location Scope, field
.2	Academic degrees and costume. College colors
.3	Endowment of research Fellowships Scholarships Student aid

.4–98	Special countries and colleges: History, reports, etc.
.99	Professional, technical and other special schools

379. PUBLIC SCHOOLS RELATION OF STATE TO EDUCATION

.1	Public school system
.13	Local support
.14	School laws and regulations School age
.15	School supervision and control: national, state and local Centralization
.16	Public colleges and universities: national, state and local
.17	Secondary schools
.171	High schools Academies
.18	Primary schools Kindergartens
.19	Evening schools
.2	Illiteracy Instruction of illiterates

The Library of Congress has recently devised a scheme of classification which is now used by the Bureau of Education and other governmental departments, as well as in some other public libraries; and, because of the exchange of index cards inaugurated by the Library of Congress, is apt to be used in many additional libraries. This scheme alone occupies a pamphlet of 168 pages. The outline of this scheme is as follows:

L–	General
11–97	Periodicals, Societies
101	Yearbooks
106	Congresses
111–791	Documents. Reports
797–898	Exhibitions. Museums
901–981	Directories

LA5–LB15	Encyclopedias
LA–	History and description
11–13	General
31	Ancient history
96	Mediæval history
106	Renaissance period and early modern
126	Modern history
205	United States
212	Primary or elementary education
222	Secondary education
226	Higher or university education

LB–	Theory of education Principles and practice of teaching
1025	General
1051	Educational psychology
1115	Child study
1137	Plays, games, etc.
1141–1547	Kindergarten and primary education
1555	Elementary or common school education
1567	Rural schools
	Field work. School excursions
1570	Curriculum
1573	Reading
1607	Secondary education
	High-school fraternities
1629	Curriculum
1630	Languages
1715	Education and training of teachers
1751–55	Teachers' associations Teachers' institutes, meetings, etc.
1763–65	Teachers' examination questions
1771	Certification of teachers
1775–1779	Teaching as a vocation
1805–2151	Normal schools
2283	International exchange of teachers
2321	**Higher education**
2332	Academic freedom
2334	Salaries and pensions
2341	Supervision and administration
2342	Discipline
2351	College entrance requirements
2353	College examinations
2361	Curriculum
2363	Electives
2365	Special subjects
2371	Graduate work and courses
2381	Degrees
2507	Legislation, laws
2523	United States
2531–2567	Canada, Mexico, Central and South America
2580–2584	England
2631–2639	France
2805	Administration — *a.* Supervision and organization
2842	Teachers' salaries and pensions
2851	School-book question
2861	Centralization of rural schools
2890–2999	By countries other than United States.
3011	Administration — *b.* Management and discipline
3025	Rewards and punishment
3033	School hours
3061–3063	Classification and grading
3063	Promotion
3081	Attendance; truancy
3087	Compulsory education
3093	Self-government
3205	School architecture and equipment
3405	School hygiene
3411	Medical inspection of schools
3483	Contagious diseases
3471	Feeding of school children
3487–3489	Special subjects
3503	School gardens
3517	Playgrounds
3525–3571	Special days (Arbor Day, Bird Day, Flag Day, etc.)
3604–3615	Student life and customs

LC–	Education — Special forms, relations, and applications
191	Education and society. Citizenship
201	Education and heredity
211	Education and crime
107–120, 351–629	Education and the church
71–188	Education and the state
129–139	Child labor and education
251–318	Moral and ethical education
321–951	Religious education
383–414	Universities
588–589	Y. M. C. A.
361–368	Sunday schools
461–629	Denominational schools
1001–1021	Humanistic education
1081	Industrial and trade education
1051–1071	Professional education (professions and occupations)
1101	Architecture
1401–2580	Education of women
1601	Coeducation
2601–2611	Indians
2701–2978	Negroes
3001–3801	Orientals
4051–4100	The destitute (orphans, outcasts, paupers, etc.)
4301	The blind
4451	The deaf
4601	Backward children
4631	Mentally defective children
4801	Mentally defective — truants, etc.
5201–5401	Continuation schools
5701–5760	Vacation schools. Summer schools
5901–6101	Correspondence schools
6201–6660	University extension

LD–United States
LE–America other than United States
LF–Europe
LG–Asia, Africa, Oceanic
LH–College and school magazines and papers

LJ–College fraternities
LT–Text-books

The third system of library classification which has common usage in the United States is the Cutter Expansive classification. The outline of the educational section as follows:

IK	EDUCATION
KC	Classical education
KE	Home education
KF	Female education
KH	Early education in general, including infant education, kindergarten, and primary school
KI	Infant education; the mind of the infant.
KM	Self-education
KP	Public education, Popular education, Compulsory education
KR	Religious education
KS	Scientific education
KT	Technical, Industrial education
L	Mechanic's institutes, Mercantile associations, Apprentices' associations, Lyceums, etc.
M	Reading clubs, Debating societies, etc.
N	Correspondence universities, Chautauqua societies, etc.
O	University extension
P	Pedagogics, Teaching
PC	Curriculum
PD	Discipline
PDC	Corporal punishment
PE	Examinations
PH	Hours of study, vacations, etc.
PI	Inspection
PM	Marking
PO	Organization
R	Means of Education
RB	Books, School
RD	Apparatus, School
RK	Laboratories, School
RL	Libraries, School
RM	Museums, School
S	Kindergartens, Object teaching
SK	Kitchen gardens, *i.e.* household training for children
T	Primary schools
U	Secondary schools, Public schools in general
V	Private schools
W	Academies, Gymnasia, Public schools like Eton, Rugby, etc.
X	Universities and Colleges
Y	Special schools; methods and history
IZA	Blind and deaf and dumb
ZB	Blind
ZC	Books for the Blind
ZD	Deaf and dumb
ZF	Feeble-minded
ZI	Indians
ZK	Criminals
ZN	Negroes, Freedmen
ZP	Poor, The
ZW	Women, Female education, Sex in education

Any one of these systems is subject to local modification, especially in case of large libraries. The third may be used in combination with the other two for more detailed analysis of any one class.

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Cutter, C. A. *Expansive Classification.* (Library Bureau, 1891.)
Dewey, Melvil. *Decimal Classification,* 7th ed. (Library Bureau, 1911.)
Library of Congress. *Classification, Class L, Education.* (Gov. Printing Office, Washington, 1911.)

LIBRARY METHOD. — In the teaching of geography, history, and other school subjects, where the final reliance of the ordinary student is placed upon books, it has become a well-established practice to supplement the class text with additional textbooks and other readings. Some teachers have gone further and required the student to do his reading in the school or public library under the normal conditions which would accompany similar work in after life. The student is trained to know the probable sources of information, to consult the proper bibliographies and guides to reading, to make his own list of references, to estimate the materials found, and finally to prepare his work in outline with reference in good form.

The library method represents an extreme reaction from the slavish use of a class text, distinctly in the right direction. The teacher who relies largely upon one or more texts is very likely not to give the student power to investigate and develop a subject under the difficulties which would confront him, once he is removed from teachers and school facilities. This is true in a slightly lessened degree where a large number of books are used as supplementary or collateral reading. Here the student knows a larger number of books to which he can make appeal, but he may not have acquired the ability to use a library. The library method bears somewhat the same relation to the modern humanities as the laboratory method does to the modern natural sciences; it makes the pupil familiar with the materials and methods which would be used in the more thoroughgoing field of research. There is distinct danger, however, that the method may be carried too far in teaching, particularly by teachers who are themselves engaged in research, and are instructing students whose present interest in the subject is general and cultural rather than specialized and investigative. The method is slow in accumulating facts for the student; it is a prolonged matter in which the young student may soon lose interest, if he does not actually take a dislike to a subject pursued by a method so costly of time and energy. Its most extended and complicated use will be found in college and university, but it ought to be somewhat used in its less complex forms in the secondary school, and perhaps even in the highest grades of the elementary school. Such a tendency exists. The growth in approval of the efforts to teach children the power of independent study is one of the broader pedagogical sanctions behind a modified application of the library method to teaching in grammar and high schools. H. S.

See History, Teaching of; Supplemental Reading.

Reference: —

Cannons, H. G. T. *Bibliography of Library Economy,* pp. 250–256. Relation of Schools and Libraries; School Libraries. (London, 1910.)

LIBRARY SERVICE, TRAINING FOR. — No formal means of training for librarianship existed in this country before 1887. The library school proper was hinted at as an ultimate desirability in the *Library Journal* of May, 1879. Interest in the subject of training was aroused in 1877 at the International Conference held in London, at which accounts were given of the Italian practice of admission to library service through examinations, and of the system employed at the Vittorio Emanuele library in Rome. The idea of library training has thus been borrowed from abroad, but its development in America has been along lines somewhat different to that in Europe.

It was not until 1886, however, that plans were made for a library school. In the meantime, certain libraries had acquired some reputation for training their apprentices, chiefly in cataloguing and classifying. But the general situation was chaotic. In 1886 announcement was made that a School of Library Economy would be opened at Columbia College, in its library on Madison Avenue and 49th Street, New York. No entrance examinations were given, and the class of nineteen or twenty students entering came from various parts of the country, some with experience in libraries, some without. The work consisted largely of lessons in cataloguing and classifying, other subjects being taught by lectures, without recitations; practical work was also arranged, but was optional at first. The first class began in January, 1887, and the course was finished in June. In 1889 the resignation of Melvil Dewey, the librarian of Columbia College, and his appointment as State Librarian, led to the removal of this school from New York to Albany, the title being changed to the New York State Library School.

In 1890 Pratt Institute of Brooklyn, N.Y., which had been carrying on a class for the benefit of its own staff, announced that this class would be open to applicants not on the library staff, and twenty-two persons undertook the course. Here also no examinations were given for the first year, and no tuition fee was charged. In the second year a small fee was required, and in 1892 entrance examinations were given. Very soon other than local candidates applied and the class became a school, supplying other libraries with assistants. In 1892 Drexel Institute, of Philadelphia, opened, with a library school among its departments, and in 1893 Armour Institute, in Chicago, tried the experiment. The two former schools are still in existence, but the last-named was removed in September, 1897, to the University of Illinois, Urbana, Ill., where it has remained. In 1897 Syracuse University offered a course in library economy; in 1904 a school was opened in connection with Western Reserve University, Cleveland; in 1905 instruction was offered by the Carnegie Library of Atlanta and Winona Institute of Indianapolis, and in 1907 by the Wisconsin Library Commission. The Carnegie Library of Pittsburg established a course for children's librarians in 1900, and Simmons College, Boston, in October, 1902, made library science a subject to be studied in connection with the regular college course. The latest school, now in process of establishment, is that connected with the New York Public Library.

The character of each school is somewhat dependent on that of the institution with which it is connected. While the same subjects appear in the curricula of all, the emphasis on certain subjects is stronger in some schools than in others. The practice which can be offered to students in a college or university library is different in degree and even in kind from that offered in a public circulating library. As yet, however, this has not led to specialization in the schools as entirely as one would imagine. The only declared attempt at specialization is that of the school connected with the Carnegie Library of Pittsburg. The Wisconsin Commission's school trains primarily for Wisconsin libraries, and the school at Atlanta for the libraries of the South, but no school refuses to enlarge the field for its graduates, when opportunity offers. The likenesses and differences of these schools can be discovered only by an examination of their various hand-books. It is evident that no type school is yet fixed.

While there is a difference of opinion among the schools as to some of the entrance requirements, the majority have an age limit of twenty years, refusing all applicants under that age. Two schools, those connected with the New York State Library and Illinois University, now make college graduation an entrance requirement. Some institutions hold a supplementary examination in addition to requiring college graduation. Others, again, give their own entrance examination more nearly suitable to the work to be taken up; the subjects of examination cover history, literature, current events, general information, French, and German. Schools that began by accepting high school certificates and diplomas or freshman requirements have gradually raised their standards and made tests definitely applicable to the work to be undertaken. A comparison of entrance examinations shows that, while there is general uniformity in the subjects required and the passing mark is usually the same, the difficulty of the examination and its value as a test vary with different schools. Examinations are very generally exchanged among the schools, and while there is not much copying, it is admitted that the practice has suggestive value. Uniformity in entrance examinations is favorably considered.

In the curricula of the schools stress was laid originally, not by intention, but of necessity, on those branches of work best exemplified in college libraries, — cataloguing, classification, reference work, and the subjects coming under the head of technical library economy. The schools have modified this preference to some extent, although the first three subjects are still the backbone of every course. The introduction into even the small libraries of the Library of Congress catalogue card has made the importance of cataloguing consist largely in the study of subject headings rather than in the writing of the catalogue card as formerly, while the modifications insisted upon by libraries using the best-known systems of classification have led to a more searching interest in classification itself rather than to the memorizing of any system. As the field of work for libraries has enlarged, the study of library extension in its various forms has become a part of the curriculum of most of the schools.

The subjects of instruction may be classed under four heads: administrative, technical, bibliographic, literary, the two first claiming more attention than the others in the present allotment of hours. The following synopsis represents the general classification under these heads: —

Administrative. — Library buildings — legislation — government — reports — rules, blanks, and forms — accounts — staff — furniture and fittings — principles of work with children, and with other classes of users.

Technical. — Classification — cataloguing — work of order department — accessions-work — alphabeting — shelf-listing — book numbers — mechanical preparation of books for the shelves — stock-taking — loan systems — keeping of statistics — care of supplies — preparation for binding.

Bibliographic. — Trade bibliography — general and subject bibliography — public documents — book selection — reference work — history of printing — history of binding — history of libraries.

Literary. — Appraisal of fiction — appraisal of current periodicals — modern European literature — study of children's books — technical French — technical German — technical Italian.

Miscellaneous. — Indexing — proofreading — typewriting (optional in most schools) — current topics — survey of library field — library extension.

A specific amount of actual practice in one or more libraries is required by all library schools, this differing in value, both as a test of the student and as a help to the student, according to the kind of library, the amount, variety, and character of practice available, the amount and quality of supervision given, and the fullness of reports made of the students' work.

At the end of one year the schools giving a general course of this duration, offer a certificate to the satisfactory student, the schools of two or more years usually withholding the highest recognition until the completion of the course, when a diploma or the degree of B. L. S. is bestowed upon the graduate.

Within the last ten years the demands made upon the library schools have increased in number and complexity. Specialization in libraries has begun and so taken hold of the imagination of those in commercial and manufacturing concerns that the largest of them are organizing or reorganizing libraries and calling for trained or experienced librarians to manage them. The schools cannot give specific training for such work, and can supply only graduates with a technical library training and general education, whereas, to make the most of such libraries, a scientific specialist is needed. Professional libraries, those of medical, law, and theological institutions, and libraries of applied science, are in the same case. The schools are called upon for a highly differentiated product, and do not have it to offer, while having plenty of demand for all that they do offer. In other words, more training, and that specialized, is needed. Another defect exists in the small number of librarians instructed in bibliographical matters. Many are interested, but, owing to the lack of old and rare books and manuscripts in American libraries, to the essentially practical American temperament, and to the lack of any instruction or opportunity for instruction, few American librarians are sufficiently versed in or sufficiently appreciative of the cultural side of their work. It is still necessary, in the largest libraries, for those having collections of rare and early books or old manuscripts, to call upon the foreigner of university education and scholastic aptitudes to deal with this material.

The interest in the two fields of special libraries and of bibliography has led within the last few years to the formation of the Special Libraries Association and of the Bibliographical Society of America, and increasing pressure has since been brought to bear upon the library schools to extend their curricula in these directions.

The immense and rapid increase of libraries, the extension of the library field to cover the work of State Library Commissions, libraries in schools, grade, high, and normal, rural and county libraries, libraries in state institutions, and the sudden rise of municipal and state legislative reference libraries, and commercial and technological libraries, call for a well-considered and far-sighted scheme of training beyond anything that is now offered.

The question of remuneration entered into the question of training very early. Numerous librarians of small libraries, who were without special schooling in their work and could not afford to attend the library schools, either became uneasy in regard to their tenure or ambitious to be prepared for better work or better positions, and a demand arose for short and inexpensive summer courses which could be pursued within the limits of an obtainable vacation or leave of absence.

For the most part, such courses have been conducted by State Library Commissions which have aimed at the raising of the professional level and not the lowering of it by short cuts to positions; they have had to face the fact that it was almost impossible to get librarians of longer training at the salaries offered, and have therefore tried to inspire the attendants on the short courses with sufficient interest to come back for several successive years until they acquire the equivalent of a year's general course.

In the same way the large city libraries, feeling unable to pay to the lowest grades of assistants the salaries required by graduates of the schools, have opened apprentice classes for training subordinate members of their staffs. Entrance to these classes is usually by examination, and after from six to nine months of instruction, combined with practice, the apprentice is eligible to a paid position. In some libraries promotion also is gained through examinations, and the qualified apprentice may reach a much better position. The only objection to these classes, from the point of view of disinterested care for librarianship, arises from the youth of the average apprentice, who has not had time for the study and reading desirable in persons engaged in an educational work and who is not likely to get time when once engaged in strenuous daily practice; from the occasional laxness of those who pass upon admissions, in regard to the personality of candidates; and from the reprehensible practice — not generally followed, however — of giving a general letter of recommendation to apprentices who cannot be given employment, thus enabling them to enter the field of general library work when their training has been in the methods of one library only.

The work for which the training class of the large library system prepares is so specific a work that its problems are less complex than those of the library schools; but as yet it has failed, with exceptions, to attract the most desirable local material, owing partly to the low salaries offered and partly to the fact that an adequate effort has not been made to set the work before persons desirable as applicants with the attractions that it undoubtedly has in itself and with an appeal to the civic spirit that exists in many young people. M. W. P.

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Public Libraries. Dewey, Melvil. Future of Library Schools, Vol. X, pp. 435–438; Hardy, E. A. Training of Librarians in the Province of Ontario, Vol. XI, pp. 143–145; Hopkins, F. M. Library Work in High Schools, Vol. X, pp. 170–171; Summer Library Schools, Vol. XI, pp. 131–134.

Putnam, H. Education for Library Work. *Independent*, Vol. LII, pp. 2773–2776.

LICENSE. — See Certification of Teachers; Teachers, Appointment of.

LICENSE, TEACHERS. — See Certification of Teachers; Examining Boards; Teachers, Training of; Teachers, Appointment of.

LICENSES TO TEACH. — See Teachers, Appointment of.

LIÈGE, UNIVERSITY OF. — See Belgium, Education in.

LIFE INSURANCE COMPANIES. — See Insurance Companies, Educational Work of.

LIGHTING OF SCHOOLHOUSES. — It is now generally established that with proper orientation and unhindered sky exposure there should be in every schoolroom from one quarter to one sixth as much glass surface as floor space, *e.g.* from 128 to 192 square feet of glazing in a room 32 feet long and 24 feet wide. This standard has been adopted in most progressive countries. Variation must, however, be provided for according to circumstances; less window space will, for example, be required where there is a long period of intense sunshine than where long foggy days of winter or even the shadow of neighboring buildings must be guarded against. Where the standard proportions are adopted, it is also necessary that the windows are properly placed and have the best orientation. This is a matter to be handled by the architect, who must make the best use of the wall space at his disposal, safeguard the external appearance of the building, and observe the hygienic laws affecting the eye. In rooms designed for primary classes the windows should be at least 3 feet 6 inches from the floor, and for all upper grades, including high schools, they should be set 4 feet above the floor. In all cases care should be taken that the windows should be higher than the eyes of the pupils when seated at their desks, and so prevent the strong light from striking the retinæ. The light needed is that reflected into the eye from the page of the book or work upon which the pupil is engaged. A strong light from the wrong direction will tend to maladjustment of the eyes, to strain of unhygienic vision, and fatigue of the ciliary muscles. (See Eye.) In addition to saving the eye, the necessity of placing the windows 3½ or 4 feet from the floor and maintaining a definitely proportioned area leads to an extension of the windows nearer to the ceiling, and one foot of glass surface near the ceiling of a schoolroom is worth more than two feet at the bottom of a low window, especially in the rooms on the ground floor, and allows the light to be more thoroughly diffused. The upper part of a window properly exposed to the light carries it farther across the room and lets it fall more directly on the work on which the pupils are engaged. The introduction of iron and steel beams in the construction of buildings permits of the extension of windows to within six inches of the ceiling without any danger to the building. The top of the glass surface ought to be at least twelve feet above the floor, allowing eight feet at least as the length of each window, without the slightest detriment to the external appearance of the building.

Unilateral Lighting. — Windows of a schoolroom should be placed on one side only. Where there are windows on opposite sides of a room, there can be but one line through the room along which the light will be equally strong from both sides, a line, however, which shifts because of the change in relative light due to the changing position of the sun and other less important factors. As a result pupils will suffer the annoyance of crosslights and be subject to direct rays of light continually. Another defect is the introduction of wedges of shadow from the walls between the windows, while the amount of window space uses up this available room for blackboards. Unilateral lighting always from the left side is the only efficient type for a schoolroom. The windows should be placed as far to the rear of the room as possible, with the mullions as narrow as possible, so as not to obstruct the light and take up space in the wall. Thus a solid or blind wall of ten feet should be left in front of the windows. No objection can be raised to this arrangement, since, as was stated above, the only effective light in a schoolroom is that reflected from the work with which the pupils are occupied, and the pupils' desks are rarely nearer the teacher's end of the room than eight feet. The position of windows here described concentrates the light and delivers it on the desks of the pupils.

Windows should never be placed facing the pupils; where they are still found they should be covered with opaque curtains so fastened to the sash that no beams of light can come through. Nor should there be windows in the rear of a room for purposes of light. Where, as in the south, they are desirable for ventilation, they should be placed about eight feet from the floor up to the level of the other windows, with which they should harmonize in size. They should be hinged on the lower side and fastened above with a spring catch. Stained glass or an opaque shade may be used with these windows, for the light should be excluded for the benefit of the teacher. If any attempt is made at decoration, a design of leaded glass will be found most successful; but the main purpose of these windows is to allow ventilation, and accordingly they should be made to open and close easily, and set so as to prevent rains from beating in.

Width of Mullions. — The mullions, it has just been stated, should be narrow. To this objection has been made that they would not afford adequate support, a valid objection in the case of two-story buildings or buildings of brick or stone construction only. A metal mullion has, however, been devised which solves this problem. This form of mullion has been used with success under many conditions. Where walls are not of necessity thick and heavy, part of the weight may be supported from above by using a steel lintel in addition to the narrow mullion. The use of the arch form of lintel which transfers the strain to a greater or less degree to the main walls in front and behind the windows is not to be recommended, because it encroaches on the window surface on both sides. The steel lintel has been used in many of the largest and most successful school buildings in New York City.

The mullion should be wedge-shaped with the edge turned outward, so that a wider gathering of light is made possible by reason of its bevelled form, and much of the shadow otherwise cast by the mullion is eliminated.

Orientation. — In the latitude of this country it is essential for purposes of lighting to open as many windows as possible toward the east or west. The east light is the best, the south is most trying and troublesome, the west is good, and the north should be used only for rooms designed for art work in its various forms. The advantage of the east light is that a room may be directly purified by the sunlight almost before school work begins, while for the rest of the day a clear white light from the eastern sky can be obtained without the glare of the direct rays of the sun. With light coming from the south it is almost impossible to keep out the direct sunshine and at the same time get indirect and diffused light into the room. Whatever means may be used, streaks of light will filter through the room and tax the accommodative muscles of the eyes. Where the noonday heat is strong, as in the south, it will be difficult to keep out the heat, and at the same time not to darken the room too much, if ventilation depends on the windows. To cut out direct sunshine and at the same time permit the air to pass unhindered is a matter of some difficulty. Venetian blinds have been recommended, but have certain defects: they are noisy, cut out the best light, are rarely adjusted to meet the exact demands and conditions, and, when rolled up, often admit pencils of light, and easily get out of order. Sliding blinds are, if anything, even less desirable. The difficulty of providing successful blinds as screens from the sun has not yet been overcome.

For the primary grades schoolrooms receiving light from the west are often more satisfactory in hot climates than those receiving light from the east, for the day's sessions of these classes is usually over before direct sunlight streams into the room. But for the upper grades lighting from the west is less desirable, since the rooms are apt in summer to become uncomfortably warm after two o'clock.

As few rooms as possible should have windows placed on the north side unless they are to be used for art work, or possibly as manual training rooms and laboratories. It is a safe rule, then, to have as many classrooms as possible facing the east or west and to utilize the space on the south for libraries, offices, physical and biological laboratories, and that on the north for drawing, manual training, and chemical laboratories. This statement will sufficiently indicate the importance of considering the lighting of schoolrooms at the time of selecting a site for the building. (See ARCHITECTURE, SCHOOL.) Sufficient has been said to show that in this country it is best that a schoolhouse should be built with its main axis running from north to south in order that the classrooms, as far as possible, may be supplied with light from the east and west. While a school building facing at an angle of 45° with the meridian would receive sufficient sunning and light in almost every room, there are disadvantages connected with the plan which make it inadvisable; thus with the main axis of the building from northeast to southwest those rooms looking toward the southeast would be troubled by the long exposure to the direct rays of the sun, giving rise to difficulties already referred to, and with the axis from southeast to northwest the rooms facing to the southwest would be affected in the afternoon both by direct sunlight and heat.

Ribbed Glass. — The problem of lighting rooms too wide for the height of windows, or those situated where sufficient window surface could not be obtained, or those too close to tall buildings, or neighboring trees, has been greatly simplified in recent years by the use of ribbed or prismatic glass. It has been used most extensively in business houses, such as stores, where deep rooms must get all their light from a restricted frontage. It is not expensive, and when set high up in a window increases and diffuses the light in a very helpful way. It is generally not advisable to set such glass in the lower part of windows of schoolrooms, on account of the glare thus produced. But for basements, dark hallways, toilet rooms, and closets it is specially valuable. For regular classrooms it is most satisfactory when placed in the upper half of the windows. There are now many dark and gloomy schoolrooms in daily use, which could be easily transformed into well lighted, cheerful rooms by the use of ribbed glass, which is comparatively inexpensive to substitute for the ordinary glass.

Artificial Lighting. — Because of this situation of the country with reference to latitude, comparatively few public schools have heretofore needed artificial lighting during the day session. But as evening schools multiply, and as school buildings come to be used more and more for various social and educational undertakings, it is rapidly becoming necessary to give this phase of school equipment more consideration. It is highly advisable, therefore, that all plans for high schools, manual training schools, and all other school buildings likely to need either power or light, should have provisions for electric wiring and such fixtures as are necessary for immediate use. In general it is good economy to thoroughly wire all school buildings, where the probability is on the side of future need for it, especially since this is not an expensive undertaking. For the same reasons gas pipes ought to be installed; for progress is rapid nowadays, and good schoolhouses ought to last a hundred years or more. It goes without saying that electric lighting is much to be preferred to gas, even though the new methods of handling gas flames insure good light. Electric lights give out but little heat, and release no bad odor or noxious gases. They reduce the danger from fires, are far more easily and quickly lighted, require less attention, and offer no dangers from leakage, or contamination of any sort. This cannot be said of gas lights under the most favorable methods yet devised. Clay gives the following table, prepared by Professor Lewes, which shows the "Comparative Hygiene Effect of Illumination per Unit of Light."

	CARBONIC ACID EVOLVED	MOISTURE EVOLVED	OXYGEN REMOVED FROM AIR	HEAT PRODUCED
Acetylene	100	100	100	100
Coal gas, flat flame .	480	1470	520	795
Coal gas, mantle . .	45	230	62	87
Petroleum, large lamp	995	700	498	246

(See FELIX CLAY, *Modern School Buildings*, London, 1902, p. 118.)

But electric lights are hard on the eyes, particularly when the filaments are visible. It is necessary, therefore, to shield the eyes from these by ground glass bulbs, or some form of refractive and dispersing globes surrounding the bulbs. The chief objection to the ground glass bulb is that it permits only about 50 per cent of the light to pass through.

As the result of some extended experiments for the Schoolhouse Commission of Boston, it was found that for direct lighting "the most satisfactory results were obtained from nine thirty-six candle power forty-watt Tungsten lamps, each equipped with the diffusing prismatic reflector. These shades are constructed of prismatic glass coated on the outer or inner surface with a white enamel."

Various forms of holophanes have been used, and the best of these give good light dispersion and at the same time shield the eyes from the glare of the globes. The chief point, however, for consideration in preparing plans for wiring schoolrooms, assembly halls, and other rooms of like sort, is to see that the wires are properly placed and that switches are conveniently arranged both for power and lights.

In villages and country districts not yet supplied with electric lighting currents, the acetylene lighting has proved very helpful. This gas, which is made by bringing calcium carbide into contact with water, gives a brilliant white light and burns quite regularly. It is not expensive to install such plants, and where a comparatively cheap and a very effective gas illuminant is needed, this form is to be recommended. It has, however, the disadvantages and dangers of all such illuminants.

F. B. D.

See ARCHITECTURE, SCHOOL, and the references there given.

LILLE, UNIVERSITY OF. — Although established as a university only as recently as 1896, this institution directly succeeded the old university at Douai which had been founded by Papal Bull in 1560 and sanctioned by Philip II of Spain in 1562. There were five faculties: of theology, civil law, canon law, medicine, and arts. The university was intended to stem the rise of Protestantism in the Low Countries. The continuity of organization and work was not broken by the change of the rulers of Flanders in the reign of Louis XVI. A decline set in during the eighteenth century, and in 1793 the university was closed by Napoleon, and in the reorganization of 1806 only the faculty of letters was restored, to be closed again from 1826 until 1854. At the latter date a faculty of medicine was added, and in 1865 a faculty of law. In 1875 a faculty of medicine and pharmacy was established at Lille, whither the other faculties were transferred in 1887. In 1890 the four faculties were recognized as a university. The enrollment of students in 1910 was 1675 (law, 567; medicine, 368; pharmacy, 109; science, 335; letters, 296). For the present organization see FRANCE, EDUCATION IN.

LILY, WILLIAM (1468–1522). — The writer of the authorized Latin grammar which for many generations was to England what for a thousand years Donatus (*q.v.*) was to Europe. Lily was born at Odiham, near Southampton, *c.* 1468, and was educated at Magdalen College, Oxford, where Grocyn (*q.v.*) lectured on theology. Lily intended to enter the priesthood, and took a pilgrimage to Jerusalem; but became converted from the priesthood of ecclesiasticism to the ministry of learning, and entered with enthusiasm into the study of Greek. At Rome he studied under Sulpitius and Pomponius Lætus Sabinus, so as to make himself a thorough Latinist. When Lily returned to London, he was ranked, with Grocyn and Linacre (*qq.v.*), among the earliest of English Renaissance Grecians and Latinists. About 1512 Lily was appointed headmaster of Colet's foundation of St. Paul's School, London, an office which he held till his death in 1522. Lily's fame as a schoolmaster is eclipsed by his authoritative *Latin Grammar*. For an account of this see LATIN LANGUAGE.

F. W.

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LIMEN. — This term has been introduced into recent psychological discussions as a substitute for the earlier term "threshold," which was employed to indicate that degree of a sensation which is just perceptible. Thus, when one begins with a very faint air vibration which is not perceptible to the ear and gradually increases its intensity, he ultimately reaches the threshold or limen of the sensation or the point at which a sound is just audible. There are also limens of difference; that is, after a sound has reached a certain intensity, if it is gradually changed so as to become more or less intense, the point is reached at which the difference in intensity is just noticeable. Sound serves as a good example, but all forms of sensory experience exhibit limen values in analogous fashion.

C. H. J.

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LIMITS. — A topic necessarily met in an elementary way in the study of plane geometry, and one that forms the subject of scientific study in the calculus, in the theory of irrational numbers, and elsewhere in more advanced mathematics. The term is difficult of simple definition, but is easily illustrated. For example, the length of a circle is, and may be defined as, the limit of the inscribed or circumscribed regular polygon of n sides, as n increases indefinitely. Similarly, the limit of the sum of the series $1, \frac{1}{2}, \frac{1}{4}, \cdots$, can easily be shown to be 2. The following definition has been suggested by Professor J. W. Young as one that is as simple as can reasonably be expected: "Let C be any linearly ordered class, and let the variable x represent any element of this class. A segment of such a class may be defined as the elements of the class which lie between two given elements of the class. Given an element a, which need not be itself an element of the class C, but which is ordered with reference to C (it may be an element of a linearly ordered class C′ containing C), a neighborhood or vicinity of a is defined as any segment of the class C such that a lies between two elements of this segment. The element a is then said to be a limit element of the class C, provided every neighborhood of a contains elements of C."

The practical question for the teacher of high school mathematics is this: where should the subject be introduced, and how extensively should it be treated?

In reply, it seems at present to be the feeling of the great majority of teachers in the United States that no scientific treatment of limits should be attempted in the high school. Incommensurable quantities (*q.v.*) are now not generally recommended for pupils of this grade, and practically the only need for the idea of limit is found in the treatment of the circle and the round solids. For this treatment nothing is required beyond the idea of limit, a strict definition like the one given above not being necessary. Theorems relating to limits are usually postponed until the calculus is reached, when the needs of the subject and the maturity of the student demand and permit their introduction. D. E. S.

LINACRE, THOMAS (1460?–1524). — Humanist physician; received his early education at Canterbury, probably at the school of the monastery of Christ Church, under William de Selling, who had visited Italy. Linacre then went to Oxford, and in 1484 was elected Fellow of All Souls. About 1485–1486 Linacre went with Selling to Italy, and at Florence was under the instruction of Politian and Demetrius Chalcondylas. He met Hermolaus Barbarus at Rome, and Aldus the printer at Venice. At Padua he stayed long enough to graduate as Doctor of Medicine. It is clear that he must have remained several years in Italy. He had already begun a translation of the book on the *Sphere* of Proclus from Greek into Latin, and this was completed or revised in England, and published by Aldus at Venice in 1499, being the first work of the Renaissance influence done by an Englishman. Linacre settled at Oxford, and was incorporated M.D. and lectured, probably, on medicine, though he taught pupils Greek, *e.g.* Sir Thomas More (*q.v.*). In 1501 he was tutor to King Henry VIII's son Arthur, and removed to London; and in 1523, together with J. L. Vives (*q.v.*), was Latin tutor and physician to the Princess Mary, for whom he wrote an elementary Latin Grammar — the *Rudimenta Grammatices* (date not known). Many editions of the *Rudimenta* also contain Vives' *De Ratione Puerili*, suggestions for systematic reading and composition. Linacre received a number of ecclesiastical appointments, though he probably did no work in them. In 1518 he founded the College of Physicians, which in the first instance held its meetings in his house in Knightrider Street, London. He also bestowed great benefactions on the University of Oxford.

In 1517 he turned his Greek studies to use for the purposes of his profession of medicine, and translated from Greek into Latin the first six books of Galen's *De Sanitate Tuenda.* (See GALEN.) In 1519 this was followed by a similar translation of Galen's *Methodus Medendi*, a great undertaking. In 1521 he translated Galen's *De Temperamentis*, a work of the first importance in its historical influence, one of the bases of the psychology of medieval and Renaissance times. With regard to these translations from classical medical writers, Dr. J. F. Payne remarks that, in spite of drawbacks, the revival of classical medicine led "immediately to the revival of anatomy, of botany, and of classical medicine as progressive sciences, and produced results quite comparable to those ascribed to the Renaissance in other departments of knowledge." Other medical translations into Latin from the Greek of Galen made by Linacre are of less importance. In 1524 he published his *De Emendata Structura Latini Sermonis.* This work was apparently written at the request of Colet to be used in St. Paul's School, but was found too comprehensive and regarded as unsuitable for the capacities of boys. Colet adopted a brief grammar (*Æditio Coleti*) drawn up by himself and Lily (*q.v.*). This incident caused a quarrel between Linacre and Colet, which Erasmus unsuccessfully tried to settle. The *De Emendata Structura* is not an ordinary grammatical accidence, but an account of Linacre's ingatherings in the way of illustration from all sources placed under the headings of the parts of speech. The significance of the work is that it is the application of the inductive method to philological and grammatical purposes, and shows a command over authors and a power of purposeful multitudinous citation, in both Latin and Greek, which was entirely new to England in 1524. In the second part of the book Linacre enters upon construction in composition, and expounds the use, with examples, of figures of speech. The last section is entirely given to Greek constructions, and the book, therefore, marks the first published Greek study in England. F. W.

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LINCOLN, ALMIRA. — See Phelps, Almira Lincoln.

LINCOLN COLLEGE, LINCOLN, ILL. — A coeducational institution chartered in 1865. In 1901 the charter was amended, making the college a constituent member of the James Milliken University (*q.v.*). Preparatory, collegiate, normal, music, and elocution departments are maintained. The college confers the degree of A.B., B.S., and Ph.B., on completion of the appropriate courses. The degrees of A.M. and M.S. are given after one year of graduate work, of which one semester must be in residence. The faculty consists of seventeen members.

LINCOLN MEMORIAL UNIVERSITY, CUMBERLAND GAP, TENN. — A coeducational institution founded in 1897 to provide higher education for the people of the mountains. Preparatory courses and domestic science, commercial, music, elocution, art, printing, industrial, agricultural, normal and collegiate departments are maintained. Courses leading to the degrees of A.B., B.S., and Mus. B. are offered. There is a faculty of twenty-eight members. The enrollment of students in 1911–1912 was 301. The Lincoln Memorial Hospital and the Lincoln Memorial Medical College, both of Knoxville, are affiliated.

LINCOLN UNIVERSITY, CHESTER CO., PA. — An institution for the higher education of the negro race, chartered in 1854 as Ashmun Institute, the present title being adopted in 1866. Collegiate and theological departments are maintained; the former is undenominational, the latter is under the control of the Presbyterian Church. The requirements for entrance to the college are fifteen units of high school work. An arts course is offered, leading to the A.B. degree. In the theological department students are admitted to the regular course if they have already pursued a college arts course or its equivalent. The degree of S.T.B. is granted. The enrollment of students in 1911–1912 was 134 in the college and forty-three in the theological seminary. The faculty consists of thirteen members.

LINDNER, GUSTAV ADOLF (1828–1887). — An Austrian educator; was born at Rozdalowitz in Bohemia and studied at the University of Prague. In 1854 he became a teacher at the gymnasium of Cilli in Styria, where he wrote his *Lehrbuch der Psychologie für Mittelsschulen.* (*Textbook of Psychology for Secondary Schools,* 1858.) This book, as well as his *Logic,* which soon followed, is still largely used in Austrian schools. In 1871 he was appointed director of the Realgymnasium at Prachatitz in Bohemia, and soon afterwards put in charge of the Czech teachers' seminary at Kuttenberg. In this position he published two textbooks on general methodology and general pedagogy, as well as his *Enzyklopädisches Handbuch der Erziehungskunde* (see Encyclopedias of Education). He was also the editor of a series of pedagogic classics, for which he translated the *Didactica Magna* of Comenius. In 1878, when the University of Prague was split into two institutions, a German and a Czech, he was called as professor of philosophy and pedagogy to the Czech university, where he taught until his death.

Lindner was largely instrumental in introducing the Herbartian psychology and pedagogy into Austrian schools. Besides the books spoken of above, he published a number of philosophical and pedagogic writings, among which may be mentioned; *Introduction to the Study of Philosophy,* 1866; *The Problem of Happiness,* 1868, and *Contributions to Social Psychology* (*Ideen zur Psychologie der Gesellschaft als Grundlage der Sozialwissenschaft,* 1871). F. M.

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LINDSLEY, PHILIP (1786–1855). — University president; graduated from Princeton in 1804. For three years he taught in the schools of New Jersey. He was tutor and professor at Princeton from 1807 to 1824, and president of the University of Nashville from 1824 to 1850. He was active in the work of the early American educational associations, and published numerous articles on educational subjects. He was one of the early advocates of normal schools for the training of teachers.

W. S. M.

LINE FORMATION IN SCHOOL ROOM. — See School Management.

LINE OF REGARD. — A single point to which both eyes are directed is called the *fixation point* or the *point of regard.* The *line of regard,* is, then, an imaginary line passing from the center of rotation of the eyeball to the point of regard. The two lines of regard, in any act of binocular fixation, thus form an angle at the point of regard. The term *plane of regard* is applied to the plane passing through both lines of regard. Both the concepts *line* and *plane* of regard are used in describing or calculating the possible movements of the eye.

R. P. A.

See Eye.

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Schaefer, E. A. *Textbook of Physiology*, Vol. II, pp. 1030 ff. (New York, 1900.)

LING, PER HENRIK (1776-1839). — The founder of the Swedish or Ling system of gymnastics; was born in Småland, one of the southern provinces of Sweden, Nov. 15, 1776. He was educated in the higher classical school at Wexio, where he distinguished himself by his "mental ability, strong individuality, firm, unyielding will, and reckless enterprise." He was dismissed from the school, with others of his comrades, in November, 1792, for some breach of school discipline. Not much is known regarding his life in the next six years, except that he was a student at Lund and Upsala universities, where he studied theology and modern languages. From 1799 to 1804 he studied philology at the University of Copenhagen, and engaged in literary work. He wrote in French, German, and Danish, translated the poem *Balder's Death* by Johannes Evald into Swedish, and wrote in Danish a three-act comedy, *The Envious Man*.

During the years of his stay in Copenhagen, Ling frequented a fencing school conducted by two Frenchmen, and there acquired great skill in the art of fencing. He also attended a private *Turnanstalt* conducted by Nachtegall, where he took up gymnastics with great enthusiasm. In 1804 Ling was appointed fencing master at the University of Lund. Besides fencing, Ling also taught riding and vaulting. He remained at Lund until 1812, when he was appointed teacher of gymnastics at the Royal Academy in Karlberg near Stockholm. Soon after taking up his work at Karlberg, he conceived the idea of founding in Stockholm a royal Central Institute for the training of teachers of gymnastics. The Institute was opened in 1814, with Ling as its director, and is still in existence. Ling taught gymnastics at Karlberg until 1825, and he retained the post of director of the Royal Central Institute from its foundation in 1814 until his death in 1839. In 1835 he was elected to membership in the Swedish Academy, and was given the honorary title of Professor and the decoration of the Order of the North Star by King Charles XIV.

Ling believed that gymnastics had a rightful place in education, medicine, and national defense. He had studied anatomy and physiology at the University of Lund, and tried to base his system and teachings upon rational and scientific foundations. He did not leave any complete treatise of his system of gymnastics. His chief works are: *The General Principles of Gymnastics*, published in 1840 by his pupils, Liedbeck and Georgii; *Regulations for Gymnastics to be Used in the Army*, published in 1836; and *Instructions in Gymnastics and Bayonet Exercises for Soldiers*, published in 1838. G. L. M.

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LIP-READING. — See Deaf, Education of.

LIPPE, PRINCIPALITY OF, EDUCATION IN. — See Germany, Education in.

LIST SPELLING. — See Spelling.

LITERARY CENSORSHIP. — **Early Period.** — The practice of supervising, restricting, or prohibiting the expression of intellectual conceptions or the dissemination of ideas is as old as the organization of society itself. Some one holding authority or claiming authority was always ready to object to the free circulation of ideas as threatening danger to existing institutions, religious or political. The two earliest authorities recognized by men, that of the ruler, whether of the family, the clan, or the State, and that of the priest, the representative of the accepted religion, were equally interested in retaining control over the direction and the expression of thought. In the earlier communities, political and religious authority were frequently combined in the same individual. It is probable that in these states the contention for an authoritative control of opinion rested chiefly upon the risk that heretical utterances might interfere with the public peace.

The earliest method of publication was in the form of the lecture or recital. A censorship or control of the utterances of the lecturer could be exercised by the very simple method of prohibiting the lecture, and, in case of contumacy, of imprisoning or killing the lecturer. The decision of the authorities at Athens in 400 B.C. that Socrates must be put to death, is often referred to as possibly the earliest recorded example of censorship by the State. It is certain that no organized official censorship ever came into existence in Greece. The philosophers and the poets appear to have lectured and written without hindrance and without supervision.

An early example of the influence of the Christian Church for the restriction or elimination of objectionable literature is described in Acts xix, 19: "Many of them also which used curious arts brought their books together and burned them before all men." This was frequently cited in later centuries by upholders of the censorship policy of the Church of Rome. Certain of the more artistically printed editions of the *Index* (for instance, the first Roman edition of the *Index* of 1758) contain, as a vignette title, a representation of Paul casting into the flames the books of magic, and beneath the print the verse from Acts.

The whole theory of church authority and of excommunication for disregard of such authority was a matter of slow development through the ages that followed the preaching of St. Paul. It was, in fact, not until the sixteenth century that there came into existence anything that could be called a censorship policy or any attempt at a general censorship system; but from the earliest periods in the history of the Church, there are instances of condemnations of individual writers, and of prohibitions, under severe penalties, of the manifolding or of the distribution of particular works. These prohibitions are usually the result of one of the series of fierce controversies about dogma that characterized the earlier centuries of the Church. They emanate for the most part from councils, but they are occasionally issued directly by the Pope or by local bishops. In certain cases, they take the form of an imperial edict; but even in these the initiative comes from a council. It is probable that the influence either of the councils or of the Emperor in restricting the multiplication or distribution of writings that had been condemned was not very effective. The edicts and decrees must be considered as representing an expression of opinion connected with some one of the bitter theological controversies of the day, rather than as regulations to be enforced. There was, in fact, no machinery for the enforcement. The work of the copying scribes could not be supervised, as was possible later for the operations of the printers, and the manuscripts could be passed from hand to hand among the sectarians without the intervention of a bookshop.

Roman Empire. — There are instances of literary censorship on the part of the imperial authorities of Rome before the institution of the Christian Church. Thus Tacitus remarks that Augustus was the first ruler who undertook to punish a word written or spoken, that is to say, a word unaccompanied by action. The law of the Roman Republic had recognized as deserving of punishment only criminal deeds, but the Emperor brought the authority of the law to bear upon writings described as libellous or scandalous (*libelli famosi*). He ordered, for instance, that the writings of Labienus should be publicly burned. His successor Tiberius issued a still stronger regulation for the supervision of undisciplined or insubordinate writings. Cremutius Cordus was driven from his occupation and left to die through poverty for the offense of speaking of Gaius Cassius as the "last Roman." His writings were ordered to be burned by the ædile. Tacitus speaks with scorn of those who, in the possession of a little momentary power, undertake to crush out opinions not in accord with their owner to prevent such opinions from being handed down to posterity. The writings of Verjinto were prohibited by Nero. Concerning this prohibition, Tacitus writes: "So long as the possession of these writings was attended by danger, they were eagerly sought and read; when there was no longer any difficulty in securing them, they fell into oblivion." This statement of literary conditions under the early Empire shows a curious resemblance to the results which obtained throughout Europe fourteen centuries later. The books which were formally condemned and the titles of which were placed on the *Index* obtained an advertisement which secured for them a decided advantage over works of the same general character that had not been fortunate enough to be picked out for reprobation. An edict ascribed to Domitian ordered that the historian Hermogenes and any book dealers who assisted in the distribution of certain writings of his which had libeled the Emperor should be crucified. Severus and certain other bishops Justinian deposed from office, because they had been lax in their supervision of literature and had permitted the wide circulation throughout the realm of prohibited books and of pernicious writings.

Catholic Church. — With the development of the Church of Rome to the ecclesiastical headship of the civilized world, the claim for the supervision of literature and for the control of the productions of authors was asserted by the Church as the legitimate successor of the imperial authority. The earliest and most sweeping censorship of the Christian Church is probably that contained in the Apostolic *Constitutions*, which purport to have been written by St. Clement of Rome at the dictation of the Apostles. These *Constitutions* prefigure the *Index* by forbidding the Christians to read any books of the Gentiles: "The Scriptures should suffice for the believer" (*Const. Apost. Lib.* 1, CVIII). This general prohibition of St. Clement (which bore date about 95 A.D.) is followed by a series of prohibitions issued by the authorities of the early Church, mainly under the decision of the councils. For instance, in 150, a synod of bishops of Asia Minor, meeting at Ephesus, prohibited the *Acta Pauli*, an historical romance written a little earlier in the century, and having for its purpose the clarification of the life and labors of St. Paul.

In 325 edicts were issued by the Emperor Constantine and prohibitions by the Council of Nicæa, against the writings of Arius and of Porphyry. The Emperor ordered the penalty of death for any who might conceal copies. In 399 the Emperor Arcadius issued an edict, based upon the recommendation of a council of the Church, ordering the destruction, under penalty of death, of all books of magic art. The various denunciations of books of magic art were, under the influence of the ecclesiastics who might happen to be in control of the proceedings of the councils, utilized for the repression of the writings of their theological opponents. In 399 the Council of Alexandria, presided over by Bishop Theophilus, issued a decree forbidding the owning or the reading of the books of Origen (*q.v.*). The Egyptian monks protested, and the bishops were obliged to call in the prefects to enforce the authority of its edicts. In 436 the Emperor Theodosius issued an edict forbidding the possession and the reading of the books of the Manicheans and ordering the burning of the same. In 446 Pope Leo I issued an edict ordering the destruction of a long series of writings described as not in accord with the teachings of the synods of Nicæa, and, therefore, antagonistic to the Christian religion. The prohibition prescribes that: " Whoever owns or reads these books is to suffer extreme punishment." In 499 Pope Gelasius issued what is later referred to as the first papal *Index*. It presents a catalogue of books prohibited, but the prohibitions have to do not with private or general, but with public or official reading. In 496 Gelasius issued a decree, confirmed later by the Emperor Gratian, which specified the patristic writings accepted and approved by the Church, and which then proceeded to the condemnation of a long series of apocryphal and heretical writings and writers. The classification of the writings to be condemned is curiously general in terms (*Haec et omnia his similia*, etc.).

These condemnations are presented as early examples of the basis of authority for the restriction of reading. The restrictions emanated for the most part from the councils, and were promulgated by the popes, while their enforcement depended upon the exercise of imperial authority. The Church and the State worked in unison for the control of expression of opinion. The orthodox opinion was that which was supported by the majority of the latest council and which secured the approval of the Pope. A year or two later the majority might be changed and the Pope replaced by an ecclesiastic representing a different school of thought. There is no record of any individual opinion on the part of the Emperor. His edicts were issued and his actions were taken under the counsel of the ecclesiastics and for the safety of the State.

From the ninth to the fifteenth centuries a long series of condemnations and prohibitions of books were ordered by various ecclesiastical authorities, councils, bishops, and popes. These prohibitions present examples of the attempts made, in advance of any system of general indexes, to supervise, control, and restrict the production and distribution of literature. The penalties placed upon the writers of books classed as heretical cover excommunication, imprisonment (sometimes for life), and, not infrequently, death. The penalties upon those who continue, after the issue of the prohibition, to distribute or to read the heretical writings cover excommunication and occasionally imprisonment. In 869 Gottschalk, a German monk, at the instance of Hincmar, Archbishop of Rheims, was excommunicated and condemned to imprisonment for life; he died after twenty years' confinement. His offense was the publication of a treatise opposing certain doctrines of St. Augustine. The conclusions arrived at by Gottschalk were, curiously enough, substantially in accord with those maintained seven centuries later by successive popes and by the " orthodox " Church generally, against the " heresies " of Jansen and Quesnel.

During the period here in question, 830–1430, it did not prove possible to secure any consistency of action on the part of the ecclesiastics undertaking to represent the authority of the Church. The changing personalities of the successive popes, the average of whose reigns was less than five years, and the varying points of view of synods and bishops, speaking from all parts of Europe, produced a series of utterances in regard to heresy which naturally enough were frequently conflicting and which might have caused serious difficulties to conscientious believers who were endeavoring in good faith to maintain for their teachings and their studies a consistently orthodox standard.

In 1215 the Fourth Synod of the Lateran condemned a tractate written by the Abbot Joachim against Peter Lombard. The *Sentences* of Lombard had been accepted by the Church as presenting the best compact statement of the views of the orthodox Church, and the book was utilized for instruction in the several university centers. The Lateran decree reads: " Any one who shall attempt to defend the heretical utterances of the said Joachim concerning the Trinity shall be thrust out as an heretic."

In 1225 the Synod at Sens condemned the treatise by Scotus Eriugena (*q.v.*) written about 860, *De Divisione Naturæ*. Pope Honorius confirmed this condemnation, and ordered that all persons possessing copies of the books must, under penalty of excommunication, deliver the same within fifteen days to the ecclesiastical authorities for burning. Scotus had, during the first century at least after his writing, been accepted as an orthodox son of the Church, but his teachings gave rise later to many controversies. In 1231 Pope Gregory IX wrote to the University of Paris directing the prohibition of the *Libri naturales* of Aristotle, which had already been condemned by the Provincial Council, until they had been freed from heresies. During the greater part of the Middle Ages, the views of Aristotle had been accepted by the Church as in accord with orthodox teachings; and as his writings made their way into Europe they were generally accepted for instruction in Montpellier, Paris, and elsewhere.

From time to time, however, some ground for protest is found on the part either of a council or a pope. One of the teachers whose influence was most potent during the middle of the thirteenth century against the heresies that were disturbing university circles was the great schoolman, Thomas Aquinas (*q.v.*). He is credited with having turned the tide of skepticism in Paris. The Minorite scholar, Petrus Johannes Oliva, who died early in the fourteenth century, is an example of an author whose writings gave occasion for conflicting decisions on the part of the highest authorities. In 1312 John XXII condemned these writings and ordered them to be destroyed; and the bones of Oliva were disinterred and were burned with copies of his books. In 1471 Sixtus IV, himself a Minorite, after further examination of the writings of Oliva, declared them to be sound in doctrine and removed the prohibition. A similar result obtained in the case of Raymond Lully, who died in 1315. In 1378 Gregory XI condemned two hundred propositions selected from Lully's treatises. In 1559 Lully's name was placed in Class II of the Roman *Index;* but in 1564 the Council of Trent decided that the condemnation was unwarranted, and freed Lully's books from prohibition.

In 1387 King Richard II of England prohibited, under penalty of imprisonment and of confiscation of property, the sale or purchase of the heretical writings of Wyclif, who had died three years earlier. This is the first instance in England, and is certainly one of the earliest in Europe, of a condemnation by royal or by political authority, which does not even in form rest upon a decision of the Church. In 1408 the Convocation of Canterbury prohibited the reading of any writings of Wyclif or any writings of the associates of Wyclif until the same had been expurgated by censors appointed by the universities of Oxford and Cambridge. In 1415 the Council of Constance condemned as heretical the writings of Wyclif. In the same year the Council took similar action in regard to the writings of John Hus, copies of which were publicly burned, and in the year following the same fate came upon Hus himself.

In 1463 Pope Pius II, Æneas Sylvius, condemned, in a Bull directed to the University of Cologne, a tractate on the Council of Basel which had been written by himself before his elevation to the papacy. He says further to the university: " In case you may find among writings of mine any that are unsound or are likely to prove pernicious, these should be analyzed and condemned." To a friend who chaffed him in regard to the correction of his own views, the Pope said very simply: " As we climb higher, we are able to see more clearly."

The great impetus given to the distribution of books by the invention of the printing press (1450) had as one result a fresh effort at supervision and control of literary production on the part of the Church. The first measures that were put into shape for the enforcement of such control provided for what has been called preventive censorship; that is, for a requirement, before the printed book could be put into circulation, of an examination and approval by ecclesiastical authorities. It was, however, not until half a century after Gutenberg had printed his first book that official cognizance was taken of the new art in a Papal Bull. And it was nearly half a century later before the Church undertook, through a system of expurgatory and prohibitory indexes, to maintain a systematic censorship upon literature. The invention of printing had as an immediate result an enormous increase in the influence upon the shaping of popular opinion of the written word, which now became the printed word, that is, of thought in the form of literature.

It was not until nearly three fourths of a century after Gutenberg, when the leaders of the Reformation were utilizing the printing presses of Wittenberg for the spread of the Protestant heresies, that the ecclesiastics became aroused to the perils that the new art was bringing upon the true faith and upon the authority of the Church. If the people were to be protected against the insidious influence of the new heresies, it was essential that some system should be instituted under which the productions of the printing press could be supervised and controlled. The more active and far-reaching the operations of the printers, the greater the necessity for the watchful supervision of their work, and the greater at the same time the difficulty in making such supervision complete and effective. The requirement was met by mandates which prohibited any books from reaching the public that had not been passed upon and approved by ecclesiastical examiners appointed for the purpose. The production and the circulation of any literature not so approved was stamped as constituting a misdemeanor of the most serious character, one that might become the final sin against the light, the offense against the Holy Ghost.

In 1559 the responsibility for the censorship of literature was assumed directly by the papal authority through the publication of the *Index Auctorum et Librorum Prohibitorum* of Paul IV, the first of a long series of papal *Indexes*, aggregating, up to 1900, forty-two in all. No *Index* has been published since that of Leo XIII, in 1900, although a number of books have been condemned by separate prohibitions. It does not appear to have been the intention either of Paul or of his successors that the responsibility for the system of censorship should be retained under the exclusive direction of the papal authorities, and there is no record of objections having been raised to the publication of *Indexes* prepared by such representatives of the Church as the theological faculties of the universities of Louvain and of Paris or by the Inquisition of Spain. There were, however, very material differences between the lists as shaped in Rome of works condemned as heretical and the similar lists issued within the same period in Louvain, Paris, or Valladolid. Books of undoubted heresy included in one *Index* failed to find place in another, and it is not possible to arrive at any consistently applied principle or policy by which the selections of the chief compilers were determined. It might at first be assumed from the wording of the prohibitions that any and all of the *Indexes* published under the direction of ecclesiastical authorities such as those specified must have been intended to be equally binding on all the faithful irrespective of political or ecclesiastical boundaries. In the majority of cases, however, no attempt was made to enforce the prohibitions of an *Index* outside of the territory of the state in which it had been promulgated. It is probable that the Roman *Indexes* were held to be in force outside of the immediate territory of the Church only after they had been formally accepted and promulgated by the authorities ecclesiastical and political of the individual states, such as Spain, France, the Empire, etc. The first of the series of papal *Indexes* was, as stated, issued under Paul IV in 1559; but as early as 1542 the Inquisition of Rome had promulgated a special edict prescribing penalties for the reading of heretical or doubtful books, and in 1545 was published the first Italian list of prohibited books and authors. This is one year earlier than the date of the *Index* of Louvain of 1546, which is usually referred to as constituting the first of the series of official *Indexes* of the Church. In 1571 the task of compiling the papal *Index* was confided by Pius V to a body organized under the name of the *Congregation of the Index,* which is still (1912) carrying on its work. These Roman *Indexes* exercised an important influence, even in the states in which the papal prohibitions were not officially published, as the titles collected for them were largely utilized by the makers of the *Indexes* of Spain, France, and Belgium; and in like manner the material put into print in Louvain, Paris, and Valladolid formed the basis of certain of the Roman lists. A more authoritative position in regard to the work of censorship was taken by the Papacy through the publication, in 1564, of the *Index* of Trent. This *Index,* as well through its formulation of the rules for censorship as because of the greater comprehensiveness of its lists, constituted the most authoritative guide that had yet been issued. The *Tridentine Index* was promulgated under the authority of the council and successive popes throughout all the Catholic states and also in countries in which the Catholic Church, while no longer the ruling power, still possessed followers. It was printed in a long series of editions issued from all the more important publishing centers; its lists formed the basis of all subsequent *Indexes,* while its famous ten rules were accepted as the guide for future censors and compilers. After the Council of Trent, a wider and more assured recognition was given by churchmen throughout the Catholic world, from which must curiously enough be excepted Catholic Spain, to the authority of the Papacy acting through the *Congregation of the Index,* to retain the general direction and control of the business of censorship.

In 1758, two centuries after the publication of the *Tridentine Index,* was issued the *Index* of Benedict XIV, in which the lists represented better bibliographical work than had been previously attempted. This *Index* is important as representing what may be called the last attempt of the Papacy to maintain any general censorship of the world's literature. The compilers of the *Index* since 1758, including that of Leo XIII, compiled in 1899 and published in 1900, content themselves with repeating the general rules or principles by which should be guided the reading of the faithful; the lists of current publications are, with a few noteworthy exceptions, limited to works of Catholic writers and chiefly to books of a doctrinal character, the teachings of which are to be found in one respect or another open to condemnation. The proportion of books absolutely prohibited becomes smaller, the greater number of the works cited being placed in the lists of *Libros expurgandos,* the reading of which is forbidden only until certain corrections or eliminations have been made (*donec corrigatur*). The *Index* of 1884 and that of 1900 bring forward from the more important of the preceding papal *Indexes* the titles of the most noteworthy of the works condemned in these. No attempt is made, however, to condemn, excepting under general rules and principles, the increasing lists of modern Protestant doctrinal books or to characterize or differentiate the great mass of the world's literature. The printing press had outgrown the machinery of ecclesiastical censorship.

The interference during the earlier centuries of printing on the part of political rulers was fitful and intermittent, and appears at no time to have arrived at the dignity of a continued policy or system. In a number of states, as in Spain, France, and the Holy Roman Empire, while the rulers continued to claim for themselves the exclusive control of the printing press, they were willing to confide to the ecclesiastics the selections of the books to be condemned and prohibited. The Catholic work of censorship, at least in the countries which remained Catholic, fell, therefore, more and more into the hands of the Church, and was as a result carried on with reference to the clerical standard of orthodoxy and morality and to the clerical theories of what was required for the welfare of the community.

The proportion of works of a purely political character that came under condemnation was small as compared with the long lists of books condemned on doctrinal grounds. During the two centuries in which censorship exerted the largest influence upon intellectual development, say from 1550 to 1750, the minds of men were directed more largely to doctrinal questions than to political matters. It was not the State, but the Church, whose authority and existence were assailed, and the contest was fought out not over political platforms, but over creeds.

When, with the beginning of the Reformation, it become apparent how great a range of influence was possessed by the printed sheet, the problem that confronted the authorities of the Church was certainly serious in more ways than one. For the space of fifteen centuries the education of the people had remained almost exclusively under the direction of the Church. The faithful had accepted their entire intellectual sustenance at the hands of the priests. In 1516 the leaders of the Reformation, in beginning their long contest against the Church of Rome, promptly availed themselves of the power of the printing press. While the words spoken in the pulpit or in the market place could reach at best but a few hundred of hearers, the tracts poured forth from the Wittenberg presses, the "flying leaves" (*Flugschriften*), carried to many thousands the teachings of Luther and Melanchthon, and it was through these "winged words" (*epea pteroenta*) that the revolt developed into a revolution.

To the devout adherents of the Church of Rome, and particularly to those to whom had been given the responsibility for its government and for the spiritual guidance of its members, the situation, not only during these earlier years of fierce strife against the Protestant heresies, but throughout the succeeding centuries, presented the gravest difficulties. There is something pathetic in the long series of attempts made by the popes, councils, bishops, congregations, and inquisitors, to protect the souls of the faithful against the baneful influence of the ever-increasing tide of literature that was pouring forth from the various publication centers, and so much of which was calculated to lead men astray from the true doctrines and to bring them into risk of everlasting perdition. To ecclesiastical rulers honestly holding such a conviction there was of course but one duty. They must use every means in their power to suppress the heresies and to warn and protect their flocks. The action of the Church was, therefore, not only logical and reasonable; it was the only course that was possible for an organization to which, as its rulers believed, the Almighty had confided the care of the spiritual welfare of mankind. The safety of the soul depended upon the nature of the intellectual sustenance, whether this were taken through the ears or through the eyes. All literature or instruction in any form, spoken, written, or printed, must, therefore, before reaching the understanding, be sifted under the authority of an all-wise and infallible Church. The believer must be protected against harm, the doubter must be recalled to the true path, and the heresies and the heretics must alike be exterminated. While it was only after the active propaganda work of the Reformers had made clear the perils of the printing press that any general system of censorship was attempted, there had been, as pointed out, instances of prohibited books centuries before the time of Gutenberg.

From 1450 on was issued a long series of papal utterances, given mainly in the form of bulls, in which is asserted the claim of the Church to the supervision and control of all literary productions before these are permitted to be distributed. The first of these papal bulls, dealing generally with the control of literature, bears date 1487. It was addressed by Pope Innocent VIII to seven "governments," as follows: Romana, Curia, Italia, Germania, Francia, Hispania Anglia, and Scotia. The opening paragraph reads: "And, therefore, we who hold on earth the place of Him who came down from heaven to enlighten the minds of men and to disperse the darkness of error, etc."

In 1520, on June 12th, Pope Leo X ordered a formal burning in Rome of the copies within reach of the writings of Luther; and with these was burned an effigy of Luther himself. This was four years after the appearance of Luther at the Diet of Worms.

The Bull *Cœnæ Domini*, the Bull of the Lord's Supper, originally issued by Urban V in 1365, was reissued by successive popes, with some modification of its provisions, at different dates up to 1586. It presents a collection of various excommunications which had been ordered by successive popes against certain specific classes of persons. The form in use through the period of the Reformation was given by Julius II in 1511. Julius specified as under excommunication a number of heretical sects including the Wycliffites or Hussites. The conclusions of the Casuists in regard to the effect of the prohibitions in the *Bulla Cœnæ* are summarized as follows by Ferraris, *Libri Prohibition.* (n. 27): In order that the reading of a book shall bring upon the delinquent the threatened excommunication: (1st) the book must be the production of an actual heretic, not merely of one not baptised, or of a Catholic who through heedlessness or ignorance has given utterance to heresy; (2d) it must contain a heresy, or must have to do with religious matters; (3d) the reader must have knowledge that the book is the work of a heretic and contains heresy or treats of religion; (4th) the reading must have been done without the permission of the Apostolic Chair. (5th) the reading must be sufficient in amount to constitute a mortal sin. This amount has naturally been variously defined, so as to cover the entire work (Sanchez), or a single page, or two lines (Toletus). (Gretser, *De Jure Prohibendi, Opera* XIII, 97).

The year 1542 is important in the history of the censorship of literature. It marks the beginning of formal regulations framed in Rome itself for the suppression of heretical literature and for the supervision and control of the work of the printers. The Inquisition of Spain, which proved to be by far the most persistent, the most effective, and the most terrible of the Inquisition organizations of the world, dates from 1480. The series of *Indexes*, prohibitory or expurgatory, had its beginning, not in Rome, but in Louvain. The first general catalogue of prohibited books was printed in Louvain in 1510. The first schedule of prohibited books printed under the name of an *Index* was, as far as is at present known, that issued by the University of Paris in 1544. The first *Index* compiled in Italy was that in Venice in 1543. The first *Index* issued under the authority of a papal Bull was compiled in 1546 by the Theological Faculty of the University of Louvain under the instructions of the Emperor Charles V. From this period on there follows a long series of *Indexes* issued by the Popes or other ecclesiastical authorities or by Catholic princes in different parts of Europe. The first *Index Expurgatorius* was issued at Valladolid in 1534 by authority of the Senate of the Inquisition. In this certain books were marked as condemned until they had been expurgated, and the compilers of the *Index* themselves prepared editions of a number of these books. According to Paulo Sarpi of Venice, famous as leader in the long contest of Venice against the ecclesiastical authority of Rome, " the Roman authorities prohibit as corrupt the text of many valuable works, particularly of the class that have to do with political science and the rights of states; they prohibit many books which have no relation to matters of theology or religion, and which they are not in fact competent to understand; they contest the right of the Republic (Venice) to prohibit pernicious books." Thus an *Index* issued at Rome under Alexander VII formally condemned the works of Copernicus and Galileo (*qq.v.*) and all other writings which confirmed the movement of the earth and the stability of the sun.

By the middle of the eighteenth century the Church authorities were finally prepared to admit the impracticability with any such means or examining bodies as could be maintained of making an individual examination of each work produced from the printing press. Such a conclusion might with better wisdom have been arrived at a century earlier. The most direct evidence of the futility of the attempts on the part of the *Congregation of the Index*, of the Roman Inquisition, and of the local inquisitors, to inform themselves intelligently concerning the nature, the orthodoxy, and the probable influence for good or for bad of the increasing mass of books brought into print from year to year, is presented by the *Indexes* themselves. The work of the compilation of these *Indexes* was placed in the hands of scholarly men, and in the majority of cases of men whose integrity of purpose and whose devotion to the higher interests of the Church need not be questioned. These devout and scholarly compilers were, however, willing to put into print under the authority of an infallible Church, instructions for the reading of believers which the most faithful of Catholics must have found difficulty in obeying with any consistency.

The *Index* lists contain many inaccuracies. The names of the authors, frequently misspelled, are entered almost at random, sometimes in the vernacular, sometimes in the Latin forms. This method, or lack of method, necessarily resulted in duplicate entries, while the copyists succeeded not infrequently in omitting altogether in their transcripts writers and books of unquestioned heresy. It became increasingly impossible for the compilers to secure personal knowledge of the contents of more than a very small proportion of the books which were to be passed upon and classed as either safe or pernicious. The judgment arrived at concerning an unfamiliar book depended in part on the name of the author and in part on that of the printer or the place of publication. Certain printing offices and certain publishing centers came to be associated in the minds of the Roman censors with heretical opinions. The general policy seems to have been that it was safer to condemn a few books not assuredly either pernicious or heretical than to run the risk of omitting from the lists any single work which might constitute an influence against the authority of the Church. The selections were also undoubtedly influenced by doctrinal issues and by the party prejudices that arose between the great orders of the Church. The direction of the censorship work in Rome both of the Inquisition and of the *Congregation* has, since their institution, remained in the hands of the Dominicans though occasionally, under the authority of a Jesuit or a Franciscan, the two latter orders secured representation on the boards of examiners.

France. — In France, censorship was retained under the direct control of the Crown to an extent paralleled in no country except England. The prohibitions of the papal *Indexes* were not accepted as binding unless confirmed by the rulers of the Gallic Church, and the French bishops seldom took action in regard to censorship, excepting under instructions emanating from the Crown. The kings of France, during the two centuries succeeding the invention of printing, were for the most part more keenly interested in furthering the operations of the printer-publishers than in protecting the doctrines of the Church and the faith of believers against the risks of heretical literature. The achievements of the Paris press brought prestige to the rulers. Even in the cases, however, in which a book might have been placed on the *Index* in Paris, it was likely to be promptly brought into print in Lyons or in Tours. If the authority of the censors succeeded in stopping the operations of provincial printers, the presses of Geneva, Cologne, and Amsterdam were ready to supply the demand that was certain to continue for a work classed as heretical or dangerous.

The law at present in force in France controlling literary censorship dates from the institution of the Republic in 1871. The wording of the law is quite voluminous. It provides, in substance, that there must be no publication containing incitement against public order, or anything offensive concerning the President of the Republic, and no publication, either in language or in pictures, of false news or of material to be classed as obscene. There must also be no publication which reflects upon the honor of any citizen, or is likely to cause moral damage to citizens.

The provisions of the law, however, are at this time (1912) very rarely enforced, except in the case of virulent attacks on the President, or on a foreign ruler or diplomatic agent. Such attacks have led to the suppression of a book, or of a particular number of a journal. Anti-military propaganda or incitements to disobey the military law have also led to the suppression of pamphlets or of specific numbers of journals. Action is, however, very rarely taken on the ground of obscenity or of personal defamation of character.

Netherlands. -- In the Low Countries, and particularly in Holland, the operations of the censors and *Index* makers of Italy, Spain, and France constituted a factor of not a little importance in furthering the development of the book trade. The printer-publishers of Holland kept themselves promptly informed of the operations of the censorship authorities. Early copies of the *Indexes* found their way, as soon as produced, to Leyden, Amsterdam, and Utrecht, and were promptly utilized by the enterprising Dutch publishers as guides for their publishing undertakings. Within a few months of the time when the censors of Rome or Madrid had completed as they supposed, the cancellation of the local editions of the condemned books, copies of the Holland issues would begin to find their way more or less surreptitiously into the hands of the readers of the country of origin. The printer-publishers of Holland were also fortunate during the two centuries in which censorship was active in having available the services of scholars who had been banished from Spain or Italy or France, or who had migrated for the purpose of securing freedom of action.

During these centuries, there was for Europe but one literary language, Latin. The Holland publishers were able, with the service of these scholarly exiles, to produce, at a comparatively low cost, for the use of scholarly readers throughout Europe, original works or great compilations which could not be undertaken by publishers in the states in which censorship was either persistently or even fitfully active. These Holland publishers were shrewd enough to utilize the censors of Rome, of Madrid, and of Paris as their literary advisers. They could bring into print with certainty of a remunerative circulation books which were important enough to have secured condemnation by the authorities of the *Index*.

It may be concluded, therefore, that outside of Spain the attempts of the Church to supervise and control the production and distribution of literature were practically without effect. It is doubtless the case that the circulation and the influence of many books were materially furthered by the stamp of ecclesiastical condemnation.

Protestant Censorship. — Irrespective of the censorship initiated by the divines, which had for its purpose the maintenance of creeds and the protection of "sound theology," history gives record of a long series of attempts, which have in fact continued into the twentieth century, to enforce what might be called political censorship, — that is to say, the control of literary production in the interests of the State and in support of the authority of the State, against opinions believed to be inimical to such authority.

The prohibitions to be classed as Protestant, whether in their origin ecclesiastical or political, do not compare favorably with the similar prohibitions issued under the authority of the Church of Rome. There is far less consistency of purpose, and, at least as far as the political edicts are concerned, there are more examples of bitter and brutal oppression than can be found anywhere in the states controlled by the Roman Church, outside of Spain. The list of books, which during the centuries in question came into condemnation under Protestant censorship, was more considerable than the aggregate of all the lists in the *Indexes* issued under the authority of the Roman Church. The censorship policy of the Protestants represented more largely the spirit of faction or personal grievance, while the political censorship was of necessity influenced by the action of the party which happened at the time to be in control or of the minister who had for the moment the ear of the ruler. Protestant censorship may be considered as less defensible than that of the Church of Rome, but as also less serious in its final effect upon intellectual activities.

It is not practicable under the conditions obtaining in modern states and with the active intercourse between the residents of such states to repress any literary productions for which a circle of readers are waiting. The books condemned and prohibited in Berlin come into print in Leipzig; or, when imperial authority controlled conditions in Leipzig, such books were without difficulty purchased in Amsterdam or Leyden. It proved to be impossible to prevent books so printed from finding their way even into the territory in which their production and distribution had been absolutely forbidden.

England. — Censorship in England was controlled, as in France, by the authority of the Crown, and varied of necessity according to the policies of the successive monarchs. The regulations for the control of heretical publications were presented in a series of royal edicts. After the time of Luther, certain regulations were issued under the sole authority of the bishops, but these could be enforced only when confirmed by the political authorities. The Crown secured the control of the operations of the English printers by restricting very closely the licenses or permits for the use of printing presses. For the first century after the introduction of printing, very little printing was done outside of London. It did not prove practicable, however, to prevent the distribution through England of books of interest to English readers which were printed in Holland. At the time when political censorship in England was most severe, the printers in Holland secured the largest returns from the book market in England. The press law passed in 1819 imposed a penalty of transportation on the writers and printers of "godless and revolutionary works." This law was repealed in 1837, and the legislation of 1869 finally secured an assured freedom for the press.

The most eloquent argument ever presented in behalf of the freedom of the press was that published in 1644 by John Milton under the title of *Areopagitica.* Milton was protesting against the claim of Parliament to control the output of the printing presses and to decide what utterances should be permitted to the citizens of the day. He writes: "We should be wary what persecution we raise against the living labours of publick men, how we spill that seasoned life of Man preserved and stored up in Bookes . . . for Bookes are not absolutely dead things, but doe contain in them a potencie of life to be as active as that Soule was whose progeny they are; nay, they do preserve as in a violl the purest efficacie and extraction of that living intellect that bread them."

Blackstone wrote that "Christianity is part of the laws of England. Offenses against it are punishable by fine, imprisonment, or other infamous corporal punishment."

In 1776, at the time of the publication of the first volume of Gibbon's *History of the Decline and Fall of the Roman Empire,* a writer who, having been educated in the Christian religion, brought into print any statements which could be interpreted as denying the truth of Christianity, was liable to imprisonment for a term of three years. Birkbeck Hill, in his introduction to Gibbon's *Autobiography,* points out that this statutory provision may well have influenced certain reticences on the part of Gibbon in his famous fifteenth chapter and in other divisions of the history having to do with Christianity.

The law at present in force in Great Britain covering the supervision of the sale of books, prints, etc., classed as obscene or as otherwise objectionable, is that of August, 1857, known as Lord Campbell's and described as 20 and 21 Vict. 83. The House of Lords and the Chancery Judges are entrusted with the authority to forbid by injunction the publication, or the continued publication, of publications which they deem to be contempts of court. Magistrates have the power to order the seizure and the destruction of books classed as obscene. The judgment in regard to such classification appears to rest with the magistrates.

In February, 1911, an association comprising peers, prelates, and schoolmasters was organized to secure an enactment by Parliament of laws which would place British literature under an efficient official censorship, and which would make impossible the publication of any book deemed by the censors to be improper or injurious. It does not seem probable, however, that legislation of this character can now be secured.

Germany. — The Imperial Statute controlling the operations of the press in Germany dates from May 7, 1874. The provisions covering material printed in periodicals are fairly strenuous, but comparatively little attempt is made to control by statute the character of material printed in books. The statute provides that every book must specify the name of the author and editor, and the name and residence of the printer. The responsibility for criminal offenses committed through publications comprising libelous or scandalous matter, etc., is cared for under the provisions of the criminal law. A literary production cannot be confiscated without prior judicial order, application for which is made either through the police or through the state attorney. The jurisdiction of the court is confined to the tribunal elected at the place of publication. Authority is exercised directly on behalf of the executive in the enforcement of the provisions of the law of libel in regard to publications which are claimed to bring the rulers into disrespect. The offense of disrespectful utterances against the ruler is described as *Majestätsbeleidigung.*

An example of the operations of German censorship in the past century is afforded in the case of the writings of Heine. By a resolution of the Bundestag (the general assembly of the German confederation) of December, 1835, a general interdict was laid upon the printing or distribution of all that Heine had written and of all that he might thereafter write. The initiation for this interdict had come from the authorities of Prussia, who had convinced themselves that the peace of the realm was being interfered with by the political writings of the poet. The curiosity of this piece of censorship was the absence of any discrimination. The censors found it easier to take the ground that all of Heine's utterances should be prohibited or prevented from reaching the German people, than to discriminate between the articles in the *Allgemeine Zeitung* on political reform and the *Book of Songs*. Heine had made his home in Paris, and he succeeded in reaching some at least of his German readers by means of editions of his works printed in French. The interdict was finally raised or passed into desuetude, as by 1840 we find Heine's publisher again announcing editions of his author's complete works.

United States. — During the Colonial period a certain measure of censorship was exercised in Massachusetts and in Connecticut under the authority of the orthodox or Congregational Church, but no attempt was ever made to formulate a general censorship policy or general prohibitions.

The national government has from time to time put into force laws prohibiting the production or the distribution of certain classes of literature. No attempt has been made in these laws to protect against attacks on dogmas or theological opinions. The general purpose has been to prevent the circulation among the general public of books *contra bonos mores*. A large latitude has been allowed in the literature of politics in the matter of criticism of the existing government. The act now in force (February, 1911) affecting literature is that of Feb. 8, 1905, ch. 550, 33 Stat. L: "It shall be unlawful for any person to deposit with an express company or other common carrier for carriage . . . within the territory of the United States and obscene, lewd, or lascivious book, pamphlet, paper, letter, writing, print. . . . Any person who shall knowingly take from such express company or other common carrier with intent to sell, distribute, or circulate any such matter, etc., shall be fined not more than $5000 or imprisoned at hard labor for not more than five years, or both at the discretion of the Court."

A further act of Aug. 5, 1909, Sec. 9, prohibits "All persons from importing into the United States any obscene book, pamphlet, paper, writing, or other production of an immoral nature. . . . Such prohibited articles, and the package in which they are contained in the course of importation, shall be detained by the officer of the Customs, etc." Under this latter provision, cases of books have been held up in the Customs because the shipment included a copy of Boccaccio's *Decameron* or of the original edition of Burton's *Arabian Nights.* No one questions the propriety of preventing or restricting the circulation of obscene literature. The difficulty is, of necessity, to secure any consistent and judicious authority for determining what literature is to be so classed and what books are likely to exert a bad influence upon the morals of the community.

Action in regard to publications classed as *contra bonos mores* is also taken under state law, the laws of the several states varying very considerably according to the difference in the standards of feelings of the different communities. In a city like New York such action is usually investigated under individual effort, such as that of the Society for the Suppression of Vice. G. H. P.

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LITERARY SOCIETY. — See Student Life.

LITERARY WHOLES. — See Reading.

LITERATURE, CHILDREN'S. — A term referring mainly to books written especially for children, and including a number of types, more or less distinct, which will be noticed later. Of the history of such literature before the eighteenth century little is known. But it seems that such books must have been insignificant both in number and in importance. In primitive times there was probably little or no difference between the tales told to the children and those told to adults; in fact, the naïveté of the adult mind and that of the child were much the same.

Folklore (*q.v.*), consisting mainly of tales, but including also proverbs and simple verses, were the common mental entertainment and instruction for both young and old. Under folklore may be classed myths, hero stories, fairy tales, and fables. The distinction between the myth and the fairy story — the latter being more commonly included in the term "folk tale" — is not easy to draw. In general the myth is more formal, more dignified, more distinctly infused with instructional or educational purpose, and likely to be a part of the religion of the race, and to introduce gods and demi-gods. The fairy tale commonly deals with humbler motives and characters, makes a homelier appeal, and seems adapted to the entertainment of simpler minds. Its delight in the marvelous, and its disregard of unity and logic are more marked than in the myth. As between the myth and the fairy story, the latter is distinctly more juvenile. A further discussion of this humbler form of folk tale can be found in Andrew Lang's *Custom and Myth*, his Introduction to Grimm's *Tales* (Bohn), and his Introduction to Perrault's *Popular Tales* (Clarendon Press), in the Appendix to Steel's *Tales of the Punjab*, and in the publications of the Folk Lore Society.

This material has been rescued from its evanescent oral form in earlier times, partly by the use made of it in great classics like Homer and the Greek dramatists, the *Nibelungenlied*, and Chaucer; and partly by the labors of philologists or antiquarians, who have obtained it from the lips of the people, or in old books like the chap-books and the ballad collections. The most noteworthy services in this latter field are those of the brothers Grimm, who collected and fixed the German folk tales between 1840 and 1850; of La Fontaine and Perrault, who retold the French folk tales in the seventeenth century; and those of a number of scholars like John Ashton, Professor Child, and others, who have within the last quarter of a century gathered up the remaining bits of tale and verse that could be found. To this type of oral and traditional literature belong also the nursery rhymes and jingles. Like the myth and fairy story, they are oral and traditional in their origin, and are the product not of any one mind, but of many. That is, each of them has probably been changed or added to in successive repetition. Like the other forms of primitive folklore, they make free use of the improbable, and seek to give entertainment rather than instruction. In some of them the appeal is evidently to the child's sense of intellectual play, — pure nonsense verse. Others bear the marks of historical events referred to playfully for the amusement of the nursery. The famous *Sing a Song of Sixpence*, for example, seems to point to the Gunpowder Plot, *My Lady Wind* to the great fire of London. The latter is, also, like a few others, clearly instructional and ethical, and still others belong to the class of riddles. In the publications of the Percy Society (Vol. IV) is to be found an interesting collection of this old-fashioned juvenile verse.

Another general type of books for children consists of the classics written for adults, but coming within the comprehension and the range of interests of children. Prominent among these are parts of Homer and the Bible, the *Arabian Nights*, *Robinson Crusoe*, *Gulliver's Travels*, and *The Pilgrim's Progress*. In these the appeal to the child is mainly in the simplicity and boldness of imagery, in the action, and in the simple and heroic elements of character. Whatever they contain of the analytic, the introspective, or the symbolic is likely to escape him. His enjoyment of Christian's conflict with Apollyon or of the experiences in the castle of Giant Despair is quite apart from the theological meaning involved; nor does it ever occur to him that the marvels told by Gulliver conceal a bitter satire against humanity. It should be added that the line between books suitable for adults and those adapted for children is further obscured in the case of much fiction and poetry. Scott and Dickens and Stevenson become the property of many children after the age of twelve; and much of the poetry of Wordsworth, Tennyson, Whittier, Longfellow, and others can be appreciated by children at a very early age. So that any good collection of reading made for children will contain many books not written primarily for them.

The third general class of children's books comprises those written primarily for children. This class, whose history is but recent and comprises scarce 500 years, has now become the largest and in some respects the most important. Interwoven as it is with the changes in the general attitude toward children, it reflects both the educational and the social ideals of the various periods in which the books appeared.

The earliest of these books in England, dating from the fifteenth century, such as *The Babees Book*, and *The Boke of Curteisie*, were devoted to instruction in manners and morals, given in the form of direct and positive precepts. What this type of book was like may be seen in the reprint of several of them in the publications of the Percy Society, Vol. IV. A fair specimen of the popular attempt at writing for the young may be seen also in the eighteenth-century chap-books, small sheets with stories or verses, generally sensational, and making the same sort of appeal as our modern " yellow journals."

Writing for children, however, may be said scarcely to have begun until the second half of the eighteenth century. Indeed, the interest in childhood seems, as reflected in the literature of the sixteenth and seventeenth centuries, to have been either non-existent or totally different from what it is now. Children were of interest, not for themselves, but only because they would become men and women later. Hence much of the teaching addressed to them, in books at least, regards them as small men and women. Even Shakespeare, whose range of view was so wide, seldom makes use of the love of children as a motive; and when he does, in rare instances, introduce a child into one of his plays, he makes the child precocious and priggish, — a child playing at being a man. From this something of the general attitude toward children in the days of Elizabeth can be gleaned.

Many of the important educational and social ideas of the nineteenth century had their roots in the eighteenth. To the eighteenth century must be assigned the beginnings of the modern attitude toward children and their education. The writings of Rousseau, Froebel, Pestalozzi, Basedow (*qq.v.*), and others created and reflected a new interest in children, and the desire to adapt educational methods to their natures. One of the earliest results of this new movement was Weisze's *Kinderfreund* (*Children's Friend*), a paper for children published in Leipzig. This same title was taken by Von Rochow (*q.v.*) for his *Primer*, a book that was intended to supply children with reading matter that should interest and please as well as instruct. In its teaching it was moral, rather than strictly religious, as earlier schoolbooks had been, and it conveyed its lesson in tales and songs. It was the first true school reading book. Its success was great and immediate. It went through many editions, and was translated into French, Dutch, Danish, and other languages.

The effect of educational ideals and purposes upon juvenile literature is especially marked in Germany. Under the influence of the Philanthropinists, Basedow and others, there arose a type of literature addressed to the understandings of children and uneducated adults. This general movement includes not only the work of Von Rochow and others mentioned above, but books like those of Campe and Salzmann (*qq.v.*), who carried on the traditions and work of the Philanthropinists. Their books, addressed to undeveloped minds, conveyed both teaching and information in the form of popular tales. Although they were of mediocre quality, from a literary point of view, they are of great interest in the evolution of juvenile literature. To the same general movement is to be assigned, in part, the popularity of *Robinson Crusoe* and of the many translations and imitations of it. Except the *Swiss Family Robinson*, by Johann Wyss, few of these imitations have survived. But for a quarter of a century they constituted a considerable part of the juvenile and the popular literature; and, for adults, a vehicle for various kinds of ethical and political propaganda.

The present important place of the folk tales, or *Märchen*, was practically secured when the brothers Grimm issued their famous collection, based to some extent on the work of Perrault (see Lang's edition of *Perrault's Popular Tales*, Oxford, 1888), in the second decade of the nineteenth century. Since that time the fairy story and folk story have been almost unchallenged in the nursery and the school. The old motives, like those of Cinderella, have been used over and over, and new motives of like interest have been invented. Easily the most distinguished successor of the brothers Grimm in this field is Hans Christian Andersen, whose distinctive work is rather that of the imaginative inventor of tales than of the discoverer of old and forgotten stories.

The attempt to supply interesting reading for children comes a little later in England, but by the beginning of the nineteenth century it is well under way. Three or four streams of influence may be distinctly traced. The Rousseau influence — and the pedagogic interest in general — are seen in the works of Thomas Day (*q.v.*), the author of the long popular and still well remembered *Sandford and Merton;* and in the books of Maria Edgeworth (*q.v.*). Her *Parents' Assistant* and other collections of tales and plays for young people were in their day very popular. They are distinctly instructional in character. Their conception of education was the learning of facts and the carrying out of iterated moral precepts. For the glamor of the marvelous and impossible, for the spirit of mere play, they had no place. It is probable that both Miss Edgeworth and her father (see EDGEWORTH, RICHARD LOVELL), — whose influence determined the character and aims of her work, — could they have read *Alice in Wonderland*, would have thought it merely a very silly book. She had little real understanding of the nature of children; or, if she had, she kept it out of her writing. And, it must be confessed, the children whom she put into her books are rather tedious little prigs. The same general comments will apply to Day's *Sandford and Merton.* Both he and Miss Edgeworth, however, have created a few scenes which stand out clear and strong. But for the most part their books and all others of their school of writing have gone to the limbo of libraries. It is, indeed, inconceivable that they could have held their own in competition with the bright, buoyant, and sympathetic books for children that came two generations later.

Another influence of the end of the eighteenth century, which led to the rise of a definite type of books, is the Sunday school movement. This movement, begun by Robert Raikes, carried on also by Hannah More and Mrs. Trimmer (*qq.v.*), is by no means an unimportant factor in the social history of the time. The leaders of the movement were not mere religious fanatics. They saw in the Sunday school a means for a much needed social regeneration among the poor. Hannah More and Mrs. Trimmer were both women not only of courage and energy, but of considerable intellectual power. Their books for the young now seem stilted in style, much too didactic in their presentation of morals, too definitely preceptorial and instructional, and too religious. Like most juvenile books of the period, they make one wonder what depraved young people they were intended for. But judged by their own time and purpose, they were effective and good. It is rather the host of later imitations, under the general head of "Sunday school books," that by their exaggerated sentimentalism, their ignorance and their false pictures of life and false standards, have brought the very name of Sunday school into reproach.

To the end of the eighteenth and the early nineteenth centuries must be assigned also the beginnings of juvenile books of literary standard. The classic *Goody Two-Shoes* is now commonly ascribed to no less a genius than Goldsmith. Charles and Mary Lamb rewrote the stories of the *Odyssey* and the tales of Shakespeare's plays for the young readers, and composed verses — most of them not very happy, it must be confessed — for children. William Blake, himself a gifted and mystical child in some respects, wrote the *Songs of Innocence*, many of which stand in the front rank of juvenile poetry. Wordsworth, though not in the least intending it, wrote some poems which have come to belong to the children more than to their elders. Isaac Watts struck out, among a mass of sententious commonplaces, a few poems that are now children's classics. And the Taylor sisters, Jane and Ann, have given us a number of things that the wise teacher would not willingly let die.

In America it is customary to trace the rise of children's books from the introduction of the famous *New England Primer*. Introduced about 1670 (a modified form of an earlier English book, which in turn has been traced back to a Protestant *Primer* produced on the suggestion of King Henry VIII), the *New England Primer* was for a hundred years or more the principal book for young pupils. It was almost entirely religious in its material, stern and uncompromising in its Puritan spirit. To the modern scientific mind its dogmatism and its sternness seem to have an element of the grotesque. But the historical and literary mind cannot but see in it something of the grave dignity and somber imagination of the old Puritans. The long life of this little book served to make it a good illustration of the way in which schoolbooks reflect the spirit of their time. For the book gradually became secularized in successive editions, until, at the end of the eighteenth century, its exclusively Puritan material had made place in large part for other ideas. How interesting the life of this little book was may be seen in Paul Leicester Ford's scholarly work, *The History of the New England Primer.*

Interesting also is the history of the *Mother Goose* collection of folk stuff. Mr. Montrose J. Moses, in his excellent work, *Children's Books and Reading*, says, "The name Mother Goose is first heard of in the seventeenth century. During 1697 Perrault published his *Histoires ou Contes du Tems Passé avec des Moralitez*, with a frontispiece of an old woman telling stories to an interested group. Upon a placard by her side was lettered the significant title:

CONTES
DE MA
MÈRE
LOYE.

There is no doubt, therefore, that the name was not of Boston origin. . . . An English edition appeared at the Hague in 1745. This seems to be the first introduction into England of *The Mother Goose Fairy Tales.*" It was John Newberry, Goldsmith's publisher, who, about 1760, issued the English nursery rhymes under the name of *Mother Goose Melodies*, and it is supposed that Goldsmith himself assisted in making the collection. Thus it has come about that in England and America the name Mother Goose is associated, not as originally with fairy tales, but with the old English nursery rhymes.

With the gradual change in national ideals, both schoolbooks and other juvenile books drew away from the strictly religious type and reflected other American ideals. In the early half of the nineteenth century there appeared many compilations of extracts from literature adapted to declamation. In that rather flamboyant period of our national life speech-making stood in high repute, and was, indeed, one of the commonest roads to fame and fortune. In the same period there were also American books corresponding to those of the instructional type in England. The most popular of these were probably the *Peter Parley* books, written by Samuel G. Goodrich. History, geography, and other information were served up in them in simple form. The history was often rather unhistorical, and the science sadly unscientific. But they were better than nothing, and better than the unwholesome "Sunday school book." In the same class are the *Rollo* books by Jacob Abbott (*q.v.*).

These, which numbered a score or more, were descriptions of travel and of other things, and were composed mainly of conversations in which voluminous information was imparted to Rollo's inquiring mind by "Uncle George." The information was generally interesting, though the style was diffuse; and on the whole the books must be set down as of the better sort.

About 1850 there arose another *genre*, the book of adventure. This type may be traced to Cooper's tales of Indian life and of the sea. His imitators were of course far below him in genius. But their books were full of action, and the thrills of the thousands of boy readers were undisturbed by any sense of the wild improbability of incident or the absurd psychology of the characters. These "dime novels," as they were commonly called, flourished for more than a quarter of a century. They were issued as complete volumes and also as serials in weekly or monthly family story papers. They have been largely supplanted now by the better books, mainly through our system of public libraries. But they are not yet an extinct species; and the crusade against them is not yet over.

It now remains to survey the field as it is to-day, to attempt an analysis of the influences at work, and a classification of the kinds of books available. Even a brief survey of the field impresses one with the wealth of material. Thousands of books are to be had whose external form is attractive, whose style is good, and whose material is sound and wholesome. Notable contributions have been made also to the art that portrays children for children from Kate Greenaway's work to that of Jessie Wilcox Smith. Instead of the crude drawing and ill-made woodcuts that once adorned juvenile books, we now have illustrations, plain and colored, that are not only adapted to the child, but that give satisfaction even to the critical adult. Scores of gifted writers, who in former times would have written only for adults, now write also for children. There is a steady stream of them, from Lewis Carroll and Charles Kingsley to Stockton and Kipling.

The first and most obvious cause is the increase in the sympathy and intelligence with which children are regarded. We have come not only to see the social and economic value of children, but to care more for them. And so we have come to identify our interests with theirs, to see things through their eyes, in a way in which our forefathers could not. The kindergarten may often have been over-sentimental and even absurd in this; but its contributions to good children's literature are undoubted. Notable among books showing this influence are the rhymes of Emilie Poulsson and the stories of Kate Douglas Wiggin.

In the same direction is the influence of modern psychology, and especially that branch of it commonly called "child study" (*q.v.*). This has given new dignity to the lives of children; has made their thoughts and emotions not less worthy of literary treatment than those of adults. Modern psychology has also its literary as well as its scientific side; that is, our writers as well as our scientists attempt to analyze the human mind truly. Such books as Mrs. Martin's *Emmy Lou* and Howells' *A Boy's Town* would hardly have been possible in an unpsychological age. One of the most significant kinds of book in this connection is that which treats of children, though written for adults; like Kenneth Grahame's *The Golden Age* or Gilson's *In the Morning Glow.*

Perhaps the most potent cause of this fullness of juvenile literature is, however, to be found in the general temper of the age; in its higher regard for all human life, its greater tenderness, its greater understanding of the weak. The distance is long between it and the bitter, somber sternness of Puritan days.

Not merely the number but the variety also of juvenile books makes classification difficult. Of folklore we have many varieties and many versions from the Greek and Norse myths to Joel Chandler Harris's delightful negro tales from the mouth of Uncle Remus; from the early tales of chivalry to the homely folk stories of almost all the countries of Europe and Asia.

The modern fairy tale, sometimes serious and sometimes humorous, extends from Lewis Carroll, through a long series including books like those of Howard Pyle, Stockton, Kingsley, Collodi (translated from the Italian), Mrs. Ewing, Mrs. Craik, Macdonald, Ruskin, and Thackeray. Stories of child life include books by Mrs. Burnett, Mrs. Craik, Mrs. Ewing, Hawthorne, Kipling, Mrs. Martin, Ouida, Mrs. Wiggin, Louisa Alcott, Carolyn Wells, Aldrich, Howells, Boyesen, Daudet, Hughes, Warner, and Trowbridge. Under tales of adventure there are the Indian story, the sea tale, the pioneer, and the explorer. Here appear authors like Cooper, Scott, Parkman, Simms, Stewart Edward White, Dana, Defoe, Sir S. W. Baker, Mary Mapes Dodge, Irving, Kipling, Roosevelt, Stevenson, Schwatka, Bullen, and Clark Russell: a plentiful assortment of fact and fiction, variously mixed.

The list of historical tales is long; some of them, beginning with Scott, are extremely good. Then there are the books geographically distinguished: books of the Arctic region, of the tropics, of Asia and Africa and Europe, and of the South and West of the United States, and, as a matter of course, of New England, the first section of our country to develop an extensive literary consciousness. The list of biographies is long; but not equal as yet in general literary qualities to other kinds of books. Good biographies for children are yet needed.

Stories of animal life and easy scientific books on out-of-door life are good, numerous, and rapidly increasing in number. With these latter must be classed the books dealing with invention, discovery, and general science.

Among the children's poets Stevenson seems easily first. Frank Dempster Sherman, Eugene Field, James Whitcomb Riley, Celia Thaxter, and others have written poetry for children which they love to hear and to read.

The list of strictly humorous work is not long, though good. But it must be remembered that humor is likely to be found now in most juvenile stories and verses.

Finally, a good many anthologies of poetry, songs set to music, and fairy tales have been made. Whittier published two, one of prose and one of verse. Patmore, Palgrave, Lang, Kate Douglas Wiggin, Mary E. Burt, E. V. Lucas, and others have made good collections. An ambitious and successful attempt at collecting a large mass of children's reading under the title of *The Children's Hour*, in ten volumes, has recently been made by one firm of publishers. Even the school readers might often be cited as good anthologies of verse and prose. Indeed, the standard is determined far more by the school and the public library than by the home. F. T. B.

A number of lists of children's readings for the guidance of teachers and parents will be found in the following works: —

Arnold, G. W. *A Mother's List of Books for Children.* (Chicago, 1909.)
Baker, F. T. A Bibliography of Children's Reading. *Teachers College Record,* January and March, 1908. (New York, 1908.)
Brooklyn Public Library. *The Child's Own Library,* 1907.
Carnegie Library, Pittsburgh. *Annotated Catalogue of Books,* 1905.
Catalogue of Books in the Children's Department. (1909.)
Colby, J. R. *Literature and Life in School.* (Boston, 1906.)
Crothers, S. M. *Miss Muffet's Christmas Party.* (Boston, 1902.)
Detroit Public Library. *Books suitable for young Children.* (1903.)
Field, E. M. *The Child and his Book: some Account of the History and Progress of Children's Literature in England.* (London, 1891.)
Field, W. T. *Fingerposts to Children's Reading.* (Chicago, 1907.)
Halsey, R. V. *Forgotten Books of the American Nursery.* (Boston, 1911.)
Hewins, C. M. *Books for Boys and Girls.* (Hartford Public Library, 1904.)
Lee, G. S. *The Child and the Book.* (New York, 1907.)
MacClintock, P. L. *Literature in the Elementary School.* (Chicago, 1908.)
McMurry, Ch. *A special Method in the Reading of complete English Classics in the Grades of the Common Schools* (New York, 1903.)
Moore, A. C. *Books recommended for a Children's Library.* (Iowa Library Commission.)
Moses, M. J. *Children's Books and Reading.* (New York, 1907.)
Potter, M. E. *Children's Catalogue.* (Minneapolis, 1910.)

More detailed discussion of various points treated in this article may be found in the following bibliography: —

See Folk Lore; Manners and Morals Education in; Myths and Mythology; New England Primer; Nursery Rhymes.

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Ashton, J. *Chap Books of the Eighteenth Century.* (London, 1882.)
Briggs, T. H. and Coffman, L. D. *Reading in the Public Schools.* (Chicago, 1911.)
Burt, M. E. *Literary Landmarks.* (Boston, 1893.)
Carpenter, Baker, and Scott. *The Teaching of English.* (London, 1902.)
Chubb, P. *The Teaching of English.* (New York, 1902.)
Earle, A. M. *Child Life in Colonial Days.* (New York, 1899.)
Ford, P. L. *History of the New England Primer.* (New York, 1897.)
Hall, G. S. *Reading, and How to Teach It.* (Boston, 1886.)
Halliwell-Phillips, J. O. *Nursery Rhymes of Old England.*
Johnson, Clifton. *Old-time Schools and School-books.* (New York, 1904.)
Kehr, K. *Geschichte des Volkschullesebuches.* (Gotha, 1888–1891.)
Koster, H. L. *Geschichte der deutschen Jugendliteratur.* Contains an extensive bibliography of the German field. (Hamburg, 1906.)
Lucas, E. V. *Old-fashioned Tales and Forgotten Tales of Long Ago.* (London, 1905.)
Moses, J. *Children's Books and Reading.* (New York, 1907.)
Pearson, E. *Banbury Chap-books and Toy Book Literature of the Eighteenth and Nineteenth Centuries.* (London, 1890.)
Reeder, R. R. *Historical Development of the School Reader.* (New York, 1900.)
Schoolroom Classics in Fiction. *Liv. Age,* Vol. CCXXXIII, pp. 385–401.
Widdemer, M. A Bibliography of Books and Articles relating to Children's Reading. *Bulletin of Bibliography* (Boston), July and October, 1911; January and April, 1912.
Wolgast, H. *Das Elend unserer Jugendliteratur.* (Leipzig, 1905.)

LITERATURE, COMPARATIVE. — An English equivalent for the foreign terms, *Vergleichende Literaturgeschichte*, *Littérature comparée*, *Letteratura comparata*, coined in apparent analogy with such expressions as "comparative anatomy" and "comparative philology." Its use in English is of fairly recent date, and the word can hardly be said to have had any wide currency until 1886, when Posnett used it as the title of a book in the International Science Series; but it soon impressed itself on literary scholarship, and ten years later Professor Marsh of Harvard could say that "the phrase Comparative Literature is afloat, and indeed seems to be constantly gaining in currency."

As early as 1863 the distinguished Italian critic, Francesco de Sanctis, had been created professor of comparative literature in the University of Naples without stipend; but it was not until 1871, when he was reappointed by royal decree, that he actually occupied the chair. During four academic years he lectured at the university with occasional intermissions, finally resigning on account of his health in 1877. With De Sanctis, therefore, the academic history of comparative literature begins. His work was for the most part confined to

Italian literature, but included a course of lectures on the history of literary criticism from Aristotle to Hegel, the manuscript of which has recently been discovered. The remarkable impression he made on his pupils, among whom were numbered Gaspary and Torraca, has been recorded by the latter in a pamphlet, *Dal "Libro della Scuola" di Francesco de Sanctis, MDCCCLXXII* (Rome, 1885), and seems to have been due to the personality of the man as much as to the talents of the scholar and teacher. His æsthetic theory owed much to Hegel and other German thinkers, while his critical method was in part derived from Sainte-Beuve. In interpreting literature, more particularly that of his own country, along these lines, and in expounding the fundamental principles of literary art, he conceived that he was justifying the title of his chair. The effect of his teaching was to broaden the study of literature in Italy, liberating it from mere pedantic detail; and he may be said to have founded a new Italian school of æsthetic criticism.

The development of comparative literature during the next decade, however, was not along the lines set by De Sanctis. The Hegelian Carrière carried on a similar tradition when, in 1884, he republished a work on *Die Poesie, ihr Wesen und ihre Formen* (which had first appeared some thirty years before), and added to its title the phrase, *mit Grundzügen der vergleichenden Literaturgeschichte.* But the tendency of the decade was toward a more precise delimitation of the field and a more scientific treatment of its subject matter. Posnett, in his book on *Comparative Literature* (London, 1886), conceived it to be a rigid science, concerned with the origins of literature and with the development of set poetic themes, a science allied to anthropology and folklore. In the next year Professor Max Koch of Breslau founded the *Zeitschrift für vergleichende Literaturgeschichte*, the first journal devoted exclusively to the advancement of comparative literature; and the founder in his announcement of the new venture limited the field to the scientific study of poetic themes, of literary sources, of the influence of one literature on another, and the like. During the nineties the subject received a remarkable impetus in the universities of Europe and America, and no less than four chairs were founded in this decade. Joseph Texte at Lyons, Louis P. Betz at Zürich, Arthur R. Marsh at Harvard University, and George E. Woodberry at Columbia University, were the pioneers in their respective countries; in 1900 Fernand Baldensperger succeeded Texte at Lyons, and in 1902 Francesco Torraca was appointed to the chair which De Sanctis had once occupied at Naples.

Of the five pioneers enumerated above, Joseph Texte, though the youngest, was the first to impress on the study of comparative literature the special significance which it has mainly continued to possess in academic instruction. His study of Rousseau as the founder of "literary cosmopolitanism" in Europe, and his *Études de Littérature Européenne*, indicate the general trend of his interest in the problems of literary relationship between the various countries of western Europe, especially during the eighteenth century. His early death in 1900 cut short a brilliant career, just at the moment when a chair of comparative literature was about to be founded for him at the University of Paris. His successor at Lyons, Fernand Baldensperger, has continued in the same regions of research, but with a particular interest in the literary relations of Germany, France, and England during the romantic period (*e.g. Goethe en France*, 1904). In Switzerland Louis P. Betz cultivated similar studies, investigating the influence of Poe and Heine in France, the origins of literary journalism at the end of the seventeenth century, and a wide range of problems of this kind. In 1900 he published a bibliography of the young science to which he was devoting his life (*La Littérature comparée; Essai bibliographique*); this compilation, the first of its kind, limits comparative literature to *Quellenforschung*, that is, to the investigation of literary sources and international influences. After his death a second edition (1904) was brought out by Baldensperger, with its scope slightly extended.

In Germany the opportunities for minute research which the new *Quellenforschung* afforded were soon realized by academic teachers; and a mass of material of this kind, much of it of slight value, has issued from the German universities during the last twenty years. In 1887 Professor Max Koch of Breslau founded the periodical already referred to; and somewhat later Professor W. Wetz, who succeeded him as editor of that journal, was called to a chair at Freiburg i. B., which he has chiefly devoted to the teaching of comparative literature. Professor Wetz's conception of his field, as expounded and illustrated in his *Shakespeare* and other works, is widely divergent from that of most of his German contemporaries. He conceives of it as a comparison not of externals, but of essentials, the comparison of one artistic method with another, of the genius of Shakespeare, for example, with that of Corneille or Calderon. As yet no German chair has been officially devoted to the subject, but doctoral monographs on comparative subjects are now issuing from the departments of modern literature in almost every German university.

The courses of Professor Child of Harvard on Chaucer and on ballad literature, as well as those of Longfellow, Lowell, and Norton on Dante, furnished the initial impulse to comparative studies at American universities; and it was at Harvard that the first chair of comparative literature was instituted. Professor Arthur R. Marsh continued mainly the medieval studies of his predecessors, coördinating them, however, by the fruitful idea of *Weltliteratur*. His academic title was "assistant professor of comparative literature"; and to that title, when he resigned from the university, Jefferson B. Fletcher succeeded in 1902. At Columbia University the Department of Literature, with George E. Woodbury as its head, had been inaugurated as early as 1890; and here, for the first time in any American institution, the study of literature was separated from all linguistic or philological detail, as a division of the field of learning, and the whole realm of European culture taken as its province. Professor Brander Matthews lectured on the evolution of the novel and the drama; and Professor Woodberry's lectures on the great monuments of European literature, on epic poetry, on the theory and practice of criticism may be read, in revised form, in his *Heart of Man* (1899), *The Torch* (1905), *Great Writers* (1907), and other works. In 1899 the first Department of Comparative Literature in an American university was inaugurated. An early result was the institution of a series of "Columbia University Studies in Comparative Literature," which included monographs on such varied subjects as *Platonism in English Poetry*, *Romances of Roguery*, *Spanish Literature in the England of the Tudors*, *A History of Literary Criticism in the Renaissance*, *The Classical Heritage of the Middle Ages*, *The Italian Renaissance in England*, and *Irish Life in Irish Fiction*. The *Journal of Comparative Literature* was founded in 1903, but discontinued publication at the end of one year. The Ropes Chair of comparative literature at the university of Cincinnati, founded in 1908, completes the academic roll-call in this country. At the present time (1910) four scholars in the United States, one each in Switzerland, France, and Italy bear the title of professor of comparative literature; but the number of other scholars actually carrying on investigations in this field is not to be estimated merely by this small array. To say that most of the teachers of modern literature in European and American universities connect themselves in some way with the field, either in their teaching or in their published work, would not be wide of the mark. England is still without a chair of comparative literature, though the unique Professorship of Poetry at Oxford continues to furnish opportunities for the discussion of comparative criticism; and such works as Professor Saintsbury's series of *Periods of European Literature*, as well as his own *History of Criticism and Literary Taste in Europe*, illustrate the growth of these studies in the British Isles.

Comparative literature has thus been variously conceived as (1) a form of literary antiquarianism, involving especially the external facts of the influence of one literature on another, of the literary sources of books, and the like; (2) the study of *Weltliteratur*, involving especially the history of literary periods, movements, types, or themes; and (3) the æsthetic criticism of literature, with incidental study of poetic principles, as a protest against literary antiquarianism. Literary scholars, from the days of ancient Rome to the end of the eighteenth century, employed the comparative method, in the sense of contrasting one author or one literature with another. But the search for a connecting link of spiritual or artistic unity in all the literatures of the world did not begin until the days of Herder; and with Goethe's idea of a *Weltliteratur* comparative literature was really born (see his *Ferneres über Weltliteratur*, 1829, in *Sämtliche Werke*, Jubiläums-Ausgabe, pp. xxxviii, 202). Matthew Arnold's dictum that "that criticism which alone can much help us for the future is a criticism which regards Europe as being for intellectual and spiritual purposes one great federation bound to a joint action and working to a common result" is a logical consequence of Goethe's idea, though Arnold has narrowed it from World Literature to European Literature. This has indeed been the general, though not the invariable, practice of scholarship; and perhaps the unity of literature is more easily apprehended when its study is confined to a single civilization like that of Europe. Literary study, conceived in this spirit, does not concern itself with each national literature as a separate and sporadic fact of history, but rather with the great international movements or types of literature, with the great literary periods, or with the interrelations of one literature with another. Academically, this has tended to break down the barriers which have separated the departments of English, French, German, etc., and ultimately the very existence of such separate departments is likely to be threatened. When that is brought about, there will no longer be need for a distinct department of comparative literature. In this sense, comparative literature has been, not a special field of research or criticism, but a method applicable alike to all fields of literary study; and its usefulness as a separate entity will cease when that method has been universally adopted. But its real field is nothing more or less than the history and criticism of literature; and though its students may limit themselves to some special phase of this wide subject, the best of them acknowledge the larger and truer allegiance, when they use the term "comparative literature" as a banner and a battle-cry. J. E. S.

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Smith, G. Gregory. Notes on the Comparative Study of Literature, *Modern Language Review.* (Cambridge, October, 1905.) The Foible of Comparative Literature, *Blackwood's Magazine.* (Edinburgh, January, 1901.)
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LITERATURE, EDUCATIONAL. — See Bibliographies of Education; Encyclopedias of Education; Journals, Educational; and the reference list appended to the various articles on education in these volumes.

LITERATURE, ENGLISH, TEACHING OF. — As early as Plato the fundamental theoretical principles which underlie the teaching of literature were already clearly stated. In the *Gorgias* the character who gives the name to this dialogue maintains that he has elaborated an art, the art of rhetoric, which is communicable by teaching and which will assure to the practitioner of that art the greatest possible happiness. Plato, on the other hand, if we may assume that Isocrates expresses Plato's opinions, maintains that what Gorgias calls an art is a false art, is merely flattery (cf. the place which is assigned to the poet in the *Republic*), and that real power has to do only with the perception of and control over that inner truth which is each man's possession in varying degrees by gift of nature, and that consequently there is no communicable art of expression based upon sound moral principles. To these two views, both manifestly presented in the extreme, should be added a third, set forth in the *Ion.* This is the doctrine of "secondary inspiration," according to which certain persons whose spirits are attuned in a peculiar manner to the writings of some specific master of literature are thus enabled to put themselves with respect to these writings into a sympathetic mood of enthusiasm which is similar to the mood of the author in composing them, and which in a certain degree is communicable to others. To illustrate this idea, Plato uses the figure of the magnetic rings. The first ring, representing the original author himself, receives its power directly from God, the source of all inspiration. The second ring, representing the interpreter of the author's writings, hangs from the first ring by means of a magnetic power derived from the original source through the medium of the first ring. In the same way a third ring may be attached to the second ring by means of a magnetic power derived through the medium of the first and second rings, and this magnetic power may continue indefinitely to be thus transmitted so long as it is strong enough to enable one ring to hold to another. In the case of a great writer like Homer, the rings may form a long chain, although by the time we get to the last ring but little of the original inspiration of Homer is left. The three principal points, therefore, which are represented in these two dialogues, expressed in terms of modern thought, are, first, the possibility of teaching the technique of an art of literature; second, the necessity of basing literature not upon technique, but upon personal character, which is not communicable and consequently not teachable; and third, the transmission of the elements of personal character not completely but in an imperfect manner by means of sympathetic appreciation or secondary inspiration. If we add to these principles a conception not possible in Plato's time, the conception of a history or development of literature, we shall have all the main ideas which underlie the modern teaching of the subject. (For the development of the study of English literature see Vernaculars, Teaching of the.)

English Literature in the Elementary and Secondary Schools. — The question of the advisability of teaching literature in the modern elementary and secondary schools appears to have been definitely answered by actual experience. Through the various stages of the elocutionary speaking of "pieces," the use of reading books, and finally the detailed and formal study of English classics, the study of literature has gradually taken its place in the school curriculum, although it is only within the present generation that extensive and specific provision has been made for such study. The cause and the justification for the contemporary emphasis placed upon the study of the English language and literature are intimately bound up with the democratic tendencies in general of both language and literature within the last three generations. English literature, beginning with the reforms of the late eighteenth and early nineteenth centuries, has become more and more in its modern manifestations an expression of general social ideas and emotions than it has ever been before, and its range of appeal has consequently become wider. Moreover, the modern school, in the extraordinary expansion by which it has assumed to itself many different kinds of activity, left by the earlier school either to the limited instruction of the parent or of special masters, has at the same time assumed certain responsibilities, necessarily arising from the instruction which the school provides in the elements of these new subjects for the public at large. Thus in teaching practically every member of the community how to read and write, the school has placed within the reach of all the elements necessary to the understanding and the practice of the literary art. Having provided the general public with the key of admission to the treasury of English literature, modern education cannot consistently abandon the public thereafter to its own undisciplined devices. A system of universal popular education logically demands that attention be given to so influential an element as literature in the life of the people; and in answer to this demand, from the lowest grades through the secondary school, the college, and the university, the study of the literature of the vernacular has come to occupy an important, and, on the whole, unquestioned place. The debatable question is no longer whether English literature shall be taught to English students, but how and with what varying degrees of emphasis it shall be taught.

Perhaps the most important single result of modern practical experience has been the turning aside from matters of information about authors and literature, as exemplified in the old-fashioned manuals of the history of literature, to an attempt at appreciation directly of the literary monuments themselves. It is now generally recognized that historical and biographical information with respect to literature is of secondary value, and that it finds its justification in instruction only when it helps the student to a truer appreciation of the literary product. The study of literature is not, therefore, an appendage to the study of history; and this is especially true in the elementary teaching of literature. The details of historical and biographical information are matters of scholarship, whereas the proper understanding of literature in its simplicity is not primarily a matter of scholarship, but rather of sensibility and feeling.

At the same time it is recognized that the teaching of elementary English literature is not altogether a matter of sensibility and feeling, and that it has elements of a severer intellectual discipline in it. In the first place, all literary expression is made up of words, and an intelligent understanding of the meanings and connotations of words is absolutely necessary to any adequate appreciation of literary monuments. The teacher, therefore, must gauge the capabilities of students with respect to the vocabulary of the literary expression under examination in such a way as to make sure that their understanding is not only clear, but also in accordance with the normal traditional usages of the language. It is not enough that students should have a definite impression of a work of literature; they must also have correct impressions. In acquiring this right understanding of words, which, as Plato has justly said, is the basis of scholarship, the teacher's most intelligent judgment and oversight are necessary. Obviously the study of a literary monument the expression of which is so far beyond the comprehension of the student that his attention is completely taken up with details, leaving him no energy for the synthesis of his impressions, should be deferred until the student has at his command a wider range both of vocabulary and of modes of thought.

Another kind of definite fact which the elementary teacher of literature may not neglect is that which has to do with certain forms of phrasing peculiar to the literary style, especially the use of figurative language. These modes of expression are usually quite outside the student's natural colloquial experience, and unless they are specifically analyzed, the significance of them is not clearly realized, even when the individual words are intelligible. It is the frequent experience of all teachers of English literature that even fairly mature students are unable to see the value of a metaphorical expression, an inability which arises not so much from an inactive intelligence as it does from unfamiliarity with the literary convention contained in the manner of expression. The study of literary style, as it was developed in the early manuals of rhetoric, and as it was based upon the study of the Greek and Latin classics, limited itself almost exclusively to the analysis and classification of figures and metaphors. The futility of all such classification merely for the sake of classification acknowledged, it must be granted also that, within proper bounds, the analysis of metaphorical expression is justifiable and necessary.

Still a third group of facts to be noted in the disciplinary study of elementary literature consists of allusions, proper names, and other matters of information embodied in the text, the understanding of which is necessary for the proper grasping of the writer's intention. Here again it is apparent that works such as some of the satires of Dryden and Pope, in which the local and contemporary allusions are so numerous as to absorb all the student's attention, are hardly appropriate material for elementary instruction.

When stress is placed heavily upon these details of fact, that is, on vocabulary, figures, allusions, etc., the result is what is often called the "philological" method of the study of literature. This kind of literary study, which arose out of a desire to give the study what was considered a disciplinary value, was much more in vogue in a preceding generation than it is at present. The study of figures of speech, for example, was made a very technical drill in the classification of the figures under the heads of an elaborate and pedantic system of classical terminology. In the same way the study of vocabulary was, and often continues to be, carried to extremes in the consideration of the etymological origins of the various words, or their comparative uses by different writers, and similar questions. The study of grammar is often combined with the study of literature, and teachers have been known to compel students to parse through every word of *In Memoriam* under the pretense of a literary study of that poem. It is perhaps sufficient to point out here that the philological method when carried to such extremes does not answer the requirements of the study of literature, however valuable it may be as a technical drill in language. The common-sense conclusion seems to be that a piece of literature should not be taken up, at least in elementary or secondary instruction, when it requires such elaborate linguistic commentary that the student's attention and energy are completely abstracted from the appreciation and enjoyment of the work merely as literature.

The more subtle questions of technique, such as those which have to do with form or structure in the larger sense, the differentiation of types, the conventions of individual types, etc., are usually, and may very well be, disregarded in elementary instruction. With the most mature students the interest of these questions with respect to literature may be considered as esoteric, and with younger students much more limited in power of abstract thought, the dwelling upon them is merely confusing. There is perhaps somewhat more justification in dwelling upon historical considerations, *e.g.* the period at which a work was written and the particular contemporary circumstances of its composition. Such details are often helpful in grasping the meaning of a work as a whole. But it is doubtful if students should be much troubled with attempts to group writers into periods, or to appreciate large general movements, like classicism and romanticism, in the earlier stages of their literary training. The usual plan of reserving such considerations for the last year of the secondary curriculum or for the college seems to be the wisest.

As to the question of transmitting appreciation for the literary monument itself, after all matters of technical detail have been disposed of, apparently little that is of practical value can be said. It will be generally conceded that Plato was right when he declared that there was no communicable technique for the best aspects of literature, and that a right feeling, "a secondary inspiration," will accomplish more than the most ingenious technical analysis. And as the Greek rhapsodists gave expression to this secondary inspiration mainly by reciting the works of the authors who inspired them, so in elementary instruction intelligent reading is often more effective than elaborate commentary.

One other aspect of the elementary study of literature presents itself insistently to the teacher, and this is the question of the relation of the study of literature to the study of morals, ideas, and civilization in general. It is obvious that' the possibilities of correlations of this kind in literary study are almost illimitable in extent. No other kind of expression has summed up so directly and so compactly as English literature has done the ideas and forces which have exerted influence upon the thought of the English people. Any adequate study of the monuments of English literature must consequently and of necessity lead over into a consideration of moral ideas. The study of *The Merchant of Venice*, of *Silas Marner*, of *The Ancient Mariner*, to choose a few examples at random, inevitably raises in each instance important questions of moral conduct which are inherent in the very conception of the works. The endeavor to exclude such discussions by limiting the choice of texts read to simple narrative, like Scott's narrative poems, seems hardly defensible, since it excludes what must be regarded as the most characteristic products of English literature. Here again a balanced and common-sense attitude toward the question of moral instruction in the teaching of literature seems to be the only one tenable. To make literature merely the vehicle for the conveyance of moral instruction, to torture a moral lesson out of every innocent poem or tale, changes the subject from the study of literature to the study of ethics, besides frequently destroying for the student the characteristic charm of the writings under consideration. On the other hand, the moral and didactic implications of many of the most important monuments of English literature cannot be disregarded without slighting what is after all one of the most persistent and prominent characteristics of the whole history of that literature.

The question of grading the material used in literary study may naturally be answered variously according to the attendant circumstances. In general, however, in the early years of the elementary pupil's development, the most appropriate material will be found in fairy tales, folk tales (see FOLKLORE), myths, and simplified forms of epic narrative. The next stage in the development of popular narrative, and the one which is most appropriate for study in the later years of the elementary school, is represented by the romantic tales of chivalry, such as the stories of King Arthur and other medieval romances, as well as chivalric stories from actual history. In the secondary school, on the other hand, considerably more attention is paid, and appropriately so, to writings which are specifically works of literary art, and which consequently bear the marks of conscious literary artifice, such, for example, as the list of "English Classics" prescribed for reading and study in preparation for entrance into college.

English Literature in the College. — In the American college, the study of English literature has advanced steadily with the growth in general of the scope of college instruction. The subject was given its first strong impulse through the academic influence of men like Longfellow, James Russell Lowell, Charles Eliot Norton, and Professor Child, in New England, of Henry Reed, professor of English literature in the University of Pennsylvania from 1831 to 1854, of Hiram Corson, now professor emeritus in Cornell University, and active professor of English literature from 1870 to 1903, and others in various parts of the country, and now is a recognized and important part of the instruction in all courses leading to the bachelor's degree. In the English universities the introduction of the subject came much later and its progress has been slower. At Oxford English literature was not introduced as a separate school of the university until the last decade of the nineteenth century. "At the first examination, which was in 1890, two candidates offered themselves, but as one scratched before the paper work began and the other as soon as it ended, there was no class-list. In 1897 the names of four men appeared in the class-list; in 1898, five; in 1899, four; in 1900, three; in 1901, two. People began to complain that the school was not as productive as they had expected, and even blamed the University. . . . Several sages declared that the subject was in fault, and that, as they had said all along, English was not a subject which could be seriously studied in an English University." (Firth, *The School of English Language and Literature*, pp. 34–35.) "It was pointed out that while male candidates could be counted on the fingers of one hand, women candidates entered for the school in large numbers, and it was inferred that the subject was not a suitable subject for men." (Firth, *ibid.*, p. 35.) The real explanation, however, seems to have been that, although the university had provided for examinations in English literature, neither the university nor the colleges, except the women's colleges, had provided for instruction. This defect was in part remedied by the appointment of Professor Raleigh to the professorship of English Literature in 1904, and by various other appointments and changes in administration both by the college and the university before and after this. "But in 1907 and in 1908 the class-list at last revealed signs of real progress. There were in the first year twelve men and seventeen women, and in the second year, twelve men and thirteen women. This increase continued, and now, in Hilary Term, 1909, there are forty-nine men reading for the school, and fifty-six women." (Firth, *ibid.*, p. 38.)

The principles which may be assumed to underlie the teaching of literature in courses leading to the bachelor's degree differ from those at the basis of elementary and secondary instruction less in kind than in the extent to which they are applied. With increased maturity in years the student is capable of studying writings of greater complexity and subtlety of thought, and of greater difficulty on the side of expression. But in the colleges also the main purpose of the teaching of literature is to bring students to a firsthand acquaintance with and appreciation of that which is regarded as good in literature. In the college, however, more attention is usually given to the formulation of conscious standards of taste and judgment than the elementary student is capable of receiving. In carrying out this purpose formal courses in criticism are sometimes given. Other methods are also employed in the college for systematizing the material of literary scholarship. These attempts usually take the form of classifying the various monuments of the literature according to some ordered system. The simplest and most obvious method of classification is naturally that which is based upon chronology. It is generally assumed that a student should be acquainted with the historical sequence of at least the great figures in the development of English literature from Beowulf to Browning. Even though the student's background of historical knowledge is not sufficient to enable him to see that the writer of any particular period is the inevitable child of his own age, the chronological classification serves a useful purpose as providing a convenient framework which the student can complete with the fuller knowledge which gradually accumulates and which alone can give him any adequate realization of historical background and perspective.

In the same way attempts are often made to classify the mass of literary material under the heading of types. General-survey courses are often given covering all the various types of English literature, — epic, romance, lyric, drama, essay, novel, etc., — and, usually in the later years of the college course, special courses in the development of particular types. This method of classification manifestly presents more difficulties than a simple chronological classification, although in compensation it may be assumed to have much greater value in bringing the student into a more intimate acquaintance with the actual content of literature and the methods of literary workmanship. The classification of literature according to types or genres, however, is obviously a method of abstract generalization based upon historical data which is apt to lead the student into a mistaken notion of types as established by some immutable dogmatic decree, of a fixed inherent nature, of which the various representations of the types are but individual exemplifications. It is plainly the teacher's duty to correct this tendency toward an "academic" attitude in the study of literature, and to prevent the system of classification, whatever it may be, from obscuring the student's vision of the actual processes of literary composition.

Still a third method of classification and of historical explanation of literature employed in college instruction is that which endeavors to study so-called developments and movements in literature. As a matter of fact, in the study of English literature, the movements are usually limited to two, or at most three.

The older periods, the Old English before the Conquest, the Middle English, centering about Chaucer, and the Elizabethan, centering about Shakespeare, are considered as periods mainly from the chronological point of view view alone, although sometimes the Elizabethan period is treated comparatively in connection with a larger European movement, the Renaissance. More frequently, however, the study of movements in college classes in literature is limited to the study of classicism as represented in the eighteenth century, and of romanticism, as exemplified in the writings of Wordsworth and his contemporaries. The attempt to classify English literature according to movements seldom goes further than this, and after the discussion of the romantic writers, a return is usually made to the chronological method in the study of the writers of the Victorian Period. It may be questioned whether a more analytical treatment of movements of English literature is advisable or practicable. Perhaps the reason why further analysis has not generally commended itself is to be found in the fact that English literature throughout its history has not fallen into such clearly defined and conscious movements and schools as other literatures, notably the French, have done.

The question of the relation of the study of literature to creative literary composition, although it seems to be frequently disregarded, is one that the college teacher of literature is legitimately bound to consider. It is, however, in many instances, modestly assumed on the part of teachers that their function is purely interpretative, and that any bent toward literary expression which the student may have, being part of his natural inheritance and gift, must be allowed to work out its own destiny. The most the teacher can do, it is urged, is to acquaint the student with such technical details as the practitioners of the art of literature in the past have shown to be obviously useful, for example, the elements of versification in the writing of poetry, and after that to lend as sympathetic an ear to the productions of the student as the wisdom or charity of the instructor will permit. Many teachers, however, go further than this, and distinctly discourage efforts at original composition on the part of their students, on the ground that very few of them have the literary gift, that it is harmful to them to be supported in the delusions of literary aspiration to which they are by nature inclined, and that if a student has a genuine gift, discouragement and opposition will not destroy it, but rather strengthen it. Such a defense as this, however, is perhaps based upon too absolute a conception of what constitutes literature. From the psychological point of view it certainly seems unjustifiable that a student's mind should be kept in the receptive and appreciative attitude throughout his whole consideration of a subject, especially since he has in his command over language, developed by natural use to a relatively high degree, the materials for the exercise of creative activity in the subject which he is studying. It would seem, therefore, that the teacher who discourages literary productivity on the part of his students merely evades the difficulties of the situation, and that the really helpful teacher will encourage creative activity at the same time that he guards the student from self-delusion and conceit. On the other hand, as a result of the increased commercial value of certain kinds of literature to-day, there are evidences of a tendency on the part of some college instructors to place great stress on the teaching of a practical technique of literature, of a sophistical art, such as Gorgias defended, which the student shall be able to put into practice with the hope of immediate pecuniary profit. Courses are thus given in short-story writing, in the novel, in the drama, and in various other kinds of writing for which there is at present a heavy commercial demand. So far as these courses really pretend to teach the art of writing short stories or plays, they fall obviously under the head of technical rather than liberal training, and aside from their immediate practical value would seem to have little justification as courses in the study of English literature. (See COMPOSITION.)

English Literature in the University. — In German and American universities English literature occupies a definite and recognized position among graduate studies leading to the doctor's degree. In Germany courses in literature for advanced students have usually been given by the professor of English philology (*q.v.*), and until recent years have been mainly concerned with the earlier periods, in the investigation of which the study of language naturally plays a large part. But the modern periods are also being studied now in Germany from Shakespeare to Kipling, and a contemporary generation of scholars who give their attention almost exclusively to literature as distinguished from linguistics is becoming increasingly active. It is interesting to observe also that a number of elaborate and in some cases important literary studies have been published within the last decade by students of English literature in the French universities. In American universities literary courses form an important part of the graduate curriculum, and in the larger universities the faculty always numbers one or more professors whose entire attention is directed to questions in this field. A comparison of the subjects of doctoral dissertations in America, issued between the years 1880 and 1895, with those for the years 1895 to the present time, shows a marked increase of interest in what might be called specifically literary subjects. In England, on the other hand, although English literary scholarship has by no means languished at the universities, the formal organization of courses for literary research and investigation is of very recent date, and these universities are consequently better known to the world at large through the publications of their distinguished faculties than through the activities of a body of disciplined students.

The methods and the purpose of the graduate study of English literature are many and various. The large proportion of students in graduate courses who intend to enter the profession of teaching unavoidably gives direction to a certain extent to graduate instruction. It is assumed, at least in American universities, that one important function of the graduate school is to provide students who enter the school with such further discipline and information as will enable them to present more adequately the subject of English literature to college classes. This end is not accomplished, however, by specifically pedagogical instruction, though logically it would seem that, if there is a place in colleges for teachers for the instruction which is usually given the methods of teaching literature in the elementary and secondary schools, there should also be a place for similar instruction for prospective college teachers. In many American universities there appears to be a partial tendency in this direction in the treatment of courses intended for candidates for the degree of Master of Arts, which are regarded not primarily as research courses, but rather as preparatory courses for teachers, or as preliminary preparation for students who expect to proceed to the doctor's degree. There results consequently a practically existent, if not theoretically accepted, distinction in the kinds of work required of candidates for the two higher degrees. The courses intended for candidates for the doctorate differ from the master's courses both in requiring a more extensive preparation and in an added stress on the side of investigation and production.

As is to be expected, the subjects covered by advanced graduate courses in English literature are largely such as come under the general head of English scholarship. Among them may be noted such subjects as have to do with the dating, the authorship, or the attendant circumstances of composition of a particular work or group of works. It will be observed that the term "literary" is broadly interpreted, and that often such topics lead into what might better be called literary antiquarianism, as when a monument, in itself apparently insignificant and uninfluential, is resuscitated merely to serve as an exhibition of the life of a past period, or when the biography of an author, or the literary gossip of his day, is examined apart from any connection which they may have with specific writings. Many of the topics undertaken by advanced students of English literature likewise connect closely with questions of economic and social development. The borrowings of one author from another, as well as less direct sources and influences, are diligently examined, a method of investigation which naturally leads over to the comparative study of literature (*q.v.*). It will be seen, therefore, that the study of the history of literature, as this subject is treated in graduate instruction, is very broadly conceived, ranging from the determination of simple questions of chronology and the details of antiquarian scholarship to the study of large national and international movements of thought. The study of sources and of comparative relationships, especially in the literature of the earlier periods, also connects intimately with such questions of primitive origins and beliefs as fall strictly under the head of folklore (*q.v.*). The origin and development of types or genres, as for example the ballad, pastoral, or drama, are also frequently subjects of graduate instruction and investigation, as well as the consideration of more specific features in a type, such as the monologue in drama, or the refrain in ballad. The number of questions similar to these which may be made the subject of graduate investigation is manifestly unlimited, and the value of such investigations in clearing away uncertain or disputed matters of literary scholarship can hardly be questioned. On the other hand, perhaps it is only fair to say that the modern graduate study of English literature, partly because of the demand for scientific method, is exposed to the danger of resting content with an arid Alexandrian scholarship which may obscure the student's view of what he rightly regards as the chief value of literature, its power of inspiring and pleasing. In default of any definite and substantial knowledge of the psychology of æsthetics, a knowledge which the literary student can hardly be expected to furnish to the world, one whole side of the study of literature, except to some extent from the historical point of view, is largely neglected in the graduate school, and that is the side of literary criticism. Moreover, in the graduate school even more than in the college, there are evidences of a disinclination to encourage or in any way to take account of original imaginative composition. The graduate study of English literature, as is quite obvious, is still strongly under the influence of the methods of study employed in the natural sciences; and as the botanist does not invent the plant to analyze, so the student of English literature need concern himself, as the botanist does, only with the data furnished him. But there is certainly a false parallelism here, and the conception of the university study of literature should be broad enough to include the man of constructive, imaginative temperament as well as the one of analytic and scientific bent of mind.

Although for the purpose of this survey the graduate study of English literature has been detached from other branches of English study, in the actual practice and organization of graduate schools no such clear separation is made. Students who are candidates for a higher degree are not entered as candidates for a degree in English literature or English language specifically, but merely as candidates for a degree in English. It is assumed that graduate students will have a comprehensive interest in the whole subject, and students whose inclinations are mainly in the direction of literary studies are required to take a certain amount of work in the English language, just as students specializing in linguistics are required to take some courses in English literature. In the administration of details there is naturally considerable divergence among the various universities. At some places all students, whether their special work is in language or literature, are required to take courses in Gothic and Old French, besides courses which deal more directly with the history of the English language. At others, students who intend to devote their time primarily to literature are not required to take Gothic and Old French. It is manifestly contrary to the spirit of graduate study to impose a rigid curriculum upon all students, and the effort is usually made to adapt the formal work of students to their individual needs and abilities. In the administration of final tests and examinations the greatest variety is to be found in the practice of the different universities, such questions being frequently left to the discretion of the individual departments. In the German universities and in some of the American universities no examinations are held until the candidate is ready to stand for his finals, preliminary to the awarding of the degree, at which time the examination is not on specific courses, but on the subject in general. But sometimes in the American universities course examinations as well as final examinations are held, and the requirement is made that students shall do "distinguished" work in their courses before they shall be permitted to proceed in their candidacy for a degree. This applies especially to the candidates for the master's degree, which is sometimes awarded, as at Harvard University, for work of a certain grade in a specified number and grouping of courses. Sometimes, however, as in the English department at Columbia University, in addition to the work in courses, the candidate for the master's degree is required to present an essay which shall embody the results of a thorough investigation of some subject carried on in connection with one of his courses. Candidates for the doctor's degree, on the other hand, are always required to present a dissertation or thesis, which shall give evidence of ability to carry out investigations with scholarly method, and which also contributes in some degree to the knowledge of the subject which the writer undertakes to investigate. In the German universities this dissertation must always be printed and accessible to the public before the degree is conferred; in some of the American universities, as at Columbia, Johns Hopkins, and others, a similar regulation is enforced; but at others, for example, Harvard University, the candidate is not required to print and publish his doctor's dissertation. G. P. K.

See Language, English, History of Study of; also Anglo-saxon; Composition; Folk Lore; Literature, Comparative; Philology; Rhetoric; Vernacular, Study of.

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LITERATURE, INSTRUCTION IN. — See Grammar; Language, English; Literature, Children's; Literature, Comparative; Greek Language and Literature; Latin Language and Literature; Oriental Language and Literature; Philology; Rhetoric; etc.

LITTLE SCHOOLS. — See Port Royalists.

LIVERPOOL UNIVERSITY, LIVERPOOL, ENGLAND. — One of the recently established English universities, founded in 1881, as the University College of Liverpool, and opened in the following year with chairs in the general arts and science subjects. The relations between the local city government and the university were strong from the beginning. In 1882 the city council purchased lands and buildings for the college. In 1883–1884 money was raised to put the college on a university basis, and the Royal Infirmary School of Medicine became a part of University College. Hitherto the students were presented for degrees before such bodies as held external examinations. In 1884 the University College became a constituent part of the Victoria University, of which Owens College, Manchester, and Yorkshire College, Leeds, were the other members. From this period on remarkable progress was made, due to the generosity and local interest in the welfare of the institution. Fellowships and scholarships were endowed; laboratories were provided and equipped in different departments; an athletic field was presented, 1891–1892; new building plans were entered upon in 1887–1888; the library was extended in 1893–1894. In 1895–1896 the first principal, Mr. G. H. Rendall, retired and was succeeded by Mr. R. T. Glazebrook. In 1897 a school of commerce and a school of hygiene were established. In 1898 the school of tropical medicine, and in 1898–1899 a professorship of education, were added. In 1899 Mr. Glazebrook was succeeded by Mr. A. W. W. Dale, the present Vice-Chancellor. With the opening of the new century an active movement was set on foot to separate from the Victoria University and to establish an independent University of Liverpool. The plans met with remarkable enthusiasm among the citizens; money was quickly raised; the city council and other local bodies came to the active assistance, and in 1903 a charter was obtained to establish the university. Since that time the institution has made great progress, and while the other neighboring universities are developing mainly, perhaps, along scientific lines, Liverpool has continued to strengthen its arts faculty and to develop on the cultural side. The following departments may be mentioned: Celtic (with which Professor Kuno Meyer was until recently connected); paleography and diplomatics; social anthropology; ethnology; archæology (classical and medieval); civic design, town planning, etc.; local history and records; school of social science and of training for social work. The total number of faculties is five: arts, science, law, engineering, and medicine (including hygiene, dental surgery, pharmacy, veterinary medicine and surgery, and tropical medicine). There are also a department of education and a university training college. Affiliated with the university are St. Aidan's College, Birkenhead, Edge Hill Training College, and Mount Pleasant Training College. A strong department of University Extension, providing general lectures to the public, and also instruction of a specialized character, is conducted by the Society for University Extension in Liverpool and District. In connection with the courses in this work traveling libraries are issued. The government of the university is in the hands of the Court; the University Council is the executive body; the Senate regulates the academic work; and Convocation is the body representing the graduates of the university. The University is maintained by endowments, grants from the Treasury, city council, and other local bodies, fees, etc. There is an active student life, which centers round the Guild of Undergraduates and numerous sectional societies and clubs. The instructing staff in 1911–1912 numbered 219, and the student enrollment was 1078 in day classes and 274 in evening classes.

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LLOYD, RICHARD (1595–1659). — A royalist clergyman and master of a private school at Oxford. He matriculated at Oxford from Oriel College and commenced B.D. in 1628. As a writer on education Lloyd shows distinct merit in his long-titled work in one volume: (1) *The Schoole-Masters Auxiliaries To remove the Barbarians Siege from Athens; Advanced under two Guides. The first, leading by Rule and Reason to read and write English dexterously. The second, asserting the Latine Tongue in Prose and Verse to its just Inlargement, Splendor and Elegancy.* (London, 1654.) (2) *Artis Poeticæ, Musarum Candidatis Addiscendæ, formula recens et dilucida.* (1653.) Lloyd takes great pains over the letters. He takes pains also in showing the power of letters, *e.g.* "*a* the deaf man's answer, *b* that doth make the honey," and so on. He pays attention to anomalies in English spelling, and suggests rules for right spelling. He advocates short lessons, slow and sure progress, care in the beginning of a subject; he requires scholars themselves to communicate knowledge to their fellows, from which masters may themselves gather hints; he treats of emulation, retribution by way of encouragement and by way of discouragement. He deals with recreation, the correction of evil manners, and the removal of truants. His rules of art in writing are one of the best accounts of the teaching of writing in schools at the time. The first part of the book, teaching to read and write English dexterously, occupies 54 pages; the Latin grammar which follows contains 153 pages; and the *Artis poeticæ formula,* 64 pages. Another edition of the *Schoole-Masters Auxiliaries* was published in 1659. F. W.

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LISBON, UNIVERSITY OF.—See Portugal, Education in.

LOBACHEVSKI, NICOLÁI IVÁNOVICH. — A Russian mathematician born at Nijni Novgorod in 1793, died at Kasan in 1856. He was one of the first to consider the essential nature of the celebrated fifth postulate of Euclid, which states (in substance) that through a given point only one line can be drawn parallel to a given line. He showed that it is possible to create a geometry, perfectly scientific in itself, in which this postulate is denied. This gave rise to one of the group of non-Euclidean geometries. (See PARALLEL LINES.) Lobachevski published several works and memoirs on geometry and astronomy. His theory of parallels has not influenced the elementary treatment of geometry, and with the present tendency to make the subject less speculative it is not liable to do so. It has had great influence, however, upon the study of higher mathematics. D. E. S.

LOCAL EXAMINATIONS, ENGLAND. — See EXAMINATIONS; LEAVING CERTIFICATES.

LOCAL SIGN. — Lotze called attention to the fact that every point on the skin when stimulated gives rise to a tactual sensation which has, in addition to its major quality, a peculiar characteristic, due to the point of application of the stimulus. Thus, the same stimulus when applied to the palm of the hand and to the back of the hand, gives rise to sensations which are alike in general quality. In the two cases, however, there is a slight qualitative character due to the point of application. This difference due to the point of application is known as the local sign. It is important in the development of ideas of tactual space, such ideas depending primarily on the systematic arrangement of local signs in series. The local signs of the retina have been described very fully by Wundt. It is a well-known fact that the same color stimulus applied to the center of the retina and to the periphery will produce qualitatively different sensations. In general, the external portions of the retina are color-blind, and especially sensitive to changes in brightness. In recognizing colored surfaces these qualitative differences are not recognized as differences in color, but as differences in space. The surface is seen as uniform in color and extended. The qualitative differences are thus converted into the percept of extension. Such an interpretation of qualitative differences into spatial characteristics is full justification for Lotze's description of local signs. C. H. J.

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LOCALIZATION OF FUNCTIONS. — See NERVOUS SYSTEM.

LOCATION, SENSE OF. — The ability to recognize directions reaches a very high state of development in certain animals, and in certain human beings, especially those who are deprived of the sense of sight. Hence, it has been regarded as a separate sense. Experiments with rats that have been deprived of their senses seem to indicate that these animals at least are guided in their movements by a general recognition of direction which is probably muscular in type. That is, they acquire a certain set of muscular adjustments, and are guided by these adjustments. Certain animals, such as carrier pigeons, may make use of the semicircular canals (see STATIC SENSE) which from their structure seem suited to indicate changes in direction. The blind probably cultivate a high degree of attention to their muscle sensations, and also to the minor indications of position through the sense of touch which normal persons neglect.

The general psychological problem of the recognition of location is discussed under the topic "space perception," where it is shown that space-perception is not due to the activity of a single sense, but to the perceptual fusion of many sensations. C. H. J.

See SPACE, PSYCHOLOGY OF.

LOCATUS. — A term denoting the assistant teacher or usher in the schools of the Middle Ages. The word was formerly derived from the Latin *locare,* to hire; this term was, however, not used of teachers, and the word *locatores* is found by the side of *locati* in some ordinances. It seems, therefore, probable that the term denoted master or teacher of a section or division, *locus, loca, Lokatien.* (See *Monumenta Germaniæ Pædagogica,* Vol. I, p. xliii.) The *locati* were usually recruited from among wandering students or bacchants (*q.v.*), or the older pupils of a school. They were engaged and were dependent on the Rector, who was himself engaged in town schools by the town council. As may be expected, in most cases the *locati* were as shiftless and unreliable as most of the members of their class. Some, however, seized the opportunities afforded by their engagement to study. Only in rare cases did they hold their positions for longer than a year.

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LOCI. — If a point in a plane is subjected to a single condition, it may occupy an infinite number of positions which follow one another in general in a continuous manner; and in this case their aggregate (*ensemble*) constitutes the geometric locus of points satisfying this condition, to the exclusion of all points which do not satisfy it. For example, if the condition is that a point in a plane shall be two inches from a fixed point of the plane, the locus is evidently a circle (circumference). Similarly we may have loci in space of three dimensions, a locus in that case being in general a surface.

As an educational matter the question arises as to when the subject of loci should be introduced into geometry, and how far it should be carried. There have been and still are those who wish to introduce it early, and there are others who wish to treat it very extensively.

In general, however, it has been recognized that the subject is one of relatively recent development in the history of geometry, and that it requires relatively greater powers of abstraction than the study of the other fundamental concepts of the subject, such as the congruance of triangles. On this account it is generally placed not earlier than the end of the first book of a geometry arranged on the Euclidean model. While it is a very extensive subject, it is felt that it does not lead to the definite and usable results that characterize the geometry that has been inherited from Euclid and Legendre, and that therefore the place for elaborate treatment is in the general literature that a mathematician should study rather than in a textbook on the elements. When the student reaches analytic geometry (*q.v.*), he necessarily takes up an extended treatment of the subject, since conics are usually studied at present as loci instead of as sections of a cone. D. E. S.

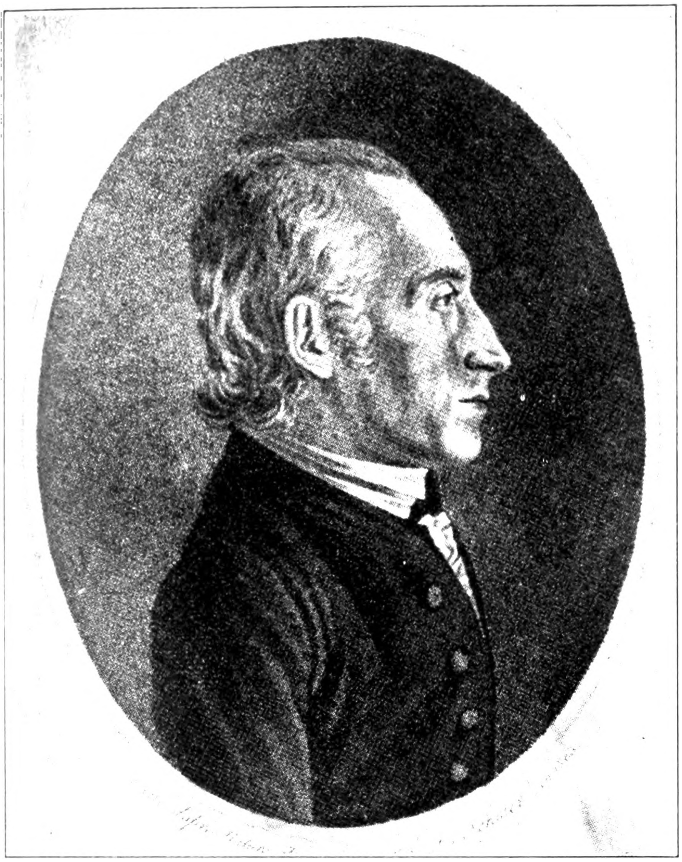
LOCKE, JOHN (1632–1704). —Locke came of Puritan parents and through his long life was associated with the influences making for liberality and tolerance in matters of opinion and action. After six years in Westminster School, he entered Oxford in 1652. His original inclination seems to have been toward the Church, but this he abandoned on account of his growing sympathy with free inquiry and his interest in experimental studies. After a year spent as secretary to Sir Walter Vane on a mission to the Elector of Brandenburg, Locke returned to Oxford in 1666 and studied medicine, but did not take a degree. His studies, however, laid the foundation for his friendship with Boyle (*q.v*) and Sydenham and stimulated his interests in the experimental method of research. In 1667 he became associated with the family of Lord Ashley, afterward the Earl of Shaftesbury. Here he acted as physician, confidential adviser, and tutor. The connection afforded him opportunities to exercise his political skill and secured for him several important posts. He was involved, however, in the fall of Shaftesbury and escaped to Holland in 1683 where he remained for six years. After 1691 he resided in the family of Sir Francis Masham at Oates in Essex, where he ended his days in the enjoyment of generous friendship and public esteem.

The complete list of Locke's writings is as follows: *Letters concerning Toleration*, 1689, 1690, 1692, 1706 (posthumous); *Two Treatises on Government*, 1690; *Essay concerning Human Understanding*, 1690; *Some Thoughts concerning Education*, 1693; *The Reasonableness of Christianity*, 1697; *Conduct of the Understanding*, 1706 (posthumous); *Some Thoughts concerning Reading and Study for a Gentleman*, 1706; *Instructions for the Conduct of a Young Gentleman*, 1706; *Of Study*, published in L. King's *Life of Locke*, 1830; the plan for *Working Schools* may be found in H. R. Fox-Bourne's *Life of John Locke*, Vol. II, pp. 377–390.

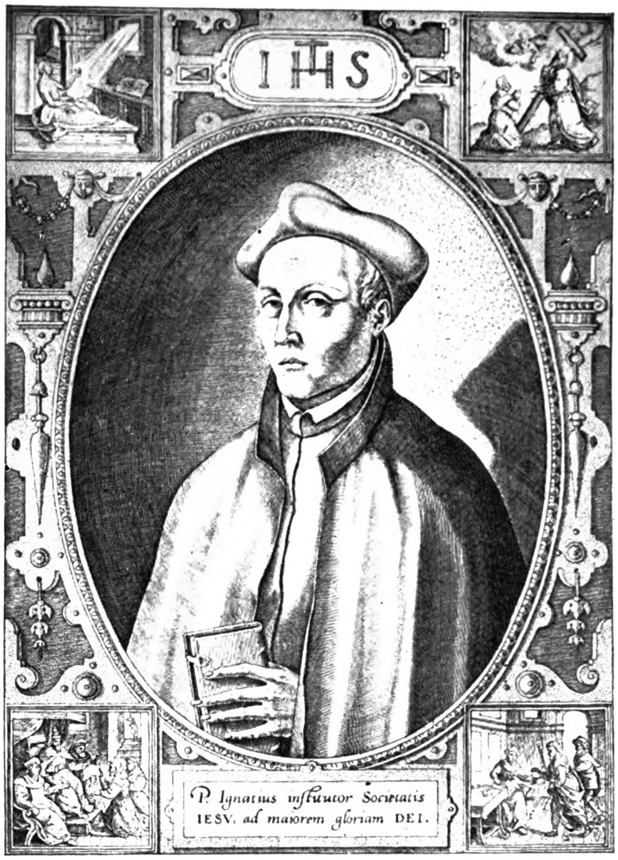
Locke's chief distinction is as a contributor to philosophy. His *Essay concerning Human Understanding* is one of the significant books in the development of modern thought. In it the philosophy of empiricism receives its first important and thoroughgoing statement. In method and results it was revolutionary. It proposed an inquiry " into the originals, certainty, and extent of human knowledge, together with the grounds and degrees of belief, opinion, and assent " with a view to discovering " how far the understanding can extend its view, how far it has faculties to attain certainty, and in what cases it can only judge and guess," in order that " we may learn to content ourselves with what is attainable by us in this state" (Bk. I, Ch. 1, 4). This inquiry was not to be based on assumed principles but principles supposed to be innate or the natural possession of the mind. It was to proceed rather under the supposition that all knowledge whatsoever is acquired by experience, experience of the outer world through the senses and of the inner world of mind through reflection on what the senses offer. Knowledge was to be viewed as an individual acquisition and to be tested and estimated through the consideration of the way that knowledge is acquired. Thus the genetic, or as Locke calls it, the " historical, plain," method of viewing experience was given its first important formulation.

The results of the inquiry were no less significant than the method. Since, according to Locke, the senses mediate between us and the world, all our knowledge finds its originals in the ideas the senses give us and is conversant about nothing else. All that we can do is to reflect on these ideas, compare them, distinguish them, and combine them. Knowledge is thus limited to the extent of the ideas we have and to the discoverable relations between them. It extends no farther and can never carry us beyond the limits set by the genetic character of experience. Yet, even so, knowledge, if we mean absolutely certain knowledge, is inadequate for the concerns of life. It must be supplemented by judgment or belief whereby we entertain probable convictions for our guidance in a world which we can know only imperfectly. In all matters of probability our judgment is influenced by the conformity of our convictions with our experience or by the testimony of the experience of others. These ideas are developed in the *Essay* with a wealth of detail and suggestion which have made the book a classic in philosophical literature.

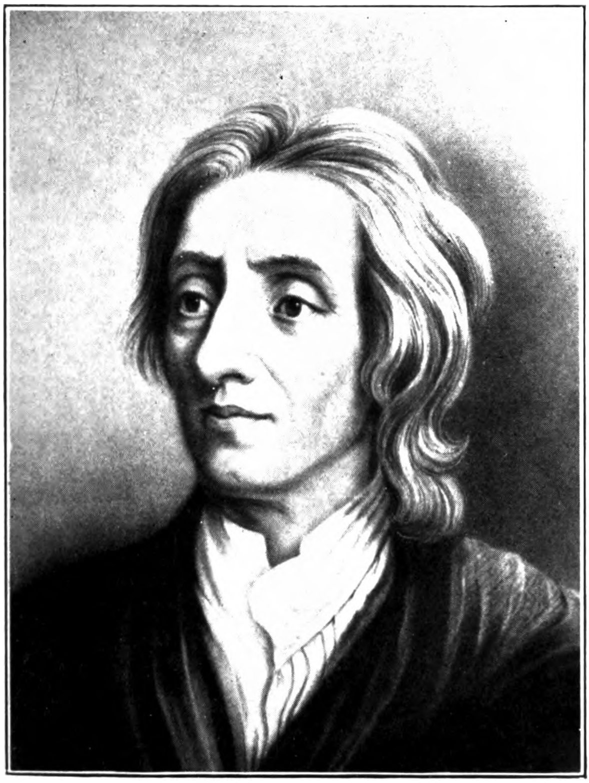
Locke's *Thoughts on Education*, which originally consisted of letters addressed to Edward Clarke advising him about the training of his son and which do not profess to deal with educa-



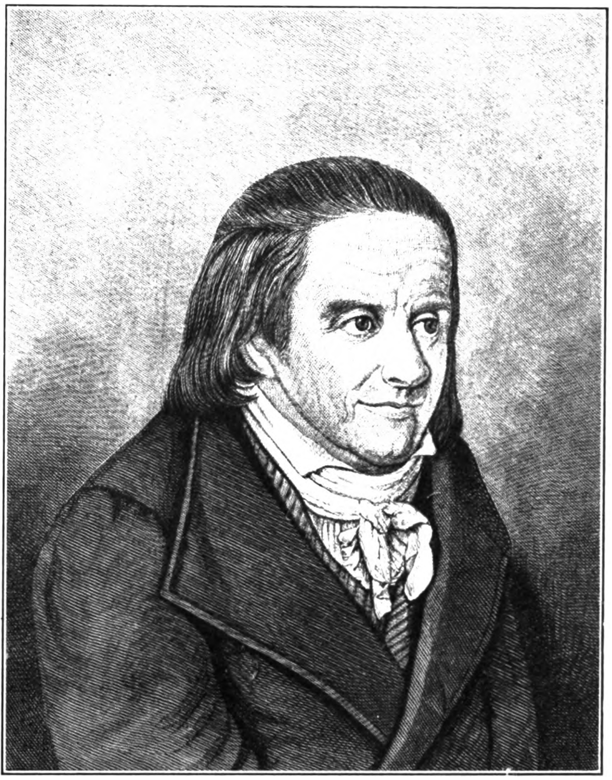
Jean Frederic Oberlin (1740–1826).
See page 522.


IHS
P. Ignatius institutor Societatis IESV, ad maiorem gloriam DEI.

Ignatius Loyola (1491–1566).
See page 91; also Vol. III, p. 533.



John Locke (1632–1704).
See page 58.



Johann Heinrich Pestalozzi (1746–1827).
See page 655.

A Group of Educational Reformers.

tion in general, but only with the education of a "young gentleman," was not the result of any extended experience as an educator. It contains rather the reflections of a keen observer and is influenced as much by Locke's philosophy as by his experience and observation. In a chapter of the *Essay, Of the Improvement of Our Knowledge* he writes: "I think I may conclude, that morality is the proper science and business of mankind in general (who are both concerned and fitted to search out their *summum bonum*) as several arts, conversant about several parts of nature, are the lot and private talent of particular men, for the common use of human life, and their own particular subsistence in this world" (Bk. 4, Ch. 12, 11). Similarly in the *Thoughts* he says that he places virtue first and most necessary among the endowments that belong to a man or a gentleman (Sec. 135). This idea, that "we are fitted for moral knowledge and natural improvements" but not for "an universal or perfect comprehension of whatever is," is the dominant idea. "The candle that is set up in us shines bright enough for all our purposes." "Our business here is not to know all things but those which concern our conduct." It is; therefore, natural to find that Locke regards the business of a tutor to be not so much to teach his pupil "all that is knowable, as to raise in him a love and esteem of knowledge; and to put him in the right way of knowing and improving himself when he has a mind to it" (Sec. 195). Thus, emphasis falls on the formation of useful habits rather than on the acquisition of knowledge. This emphasis is reënforced by Locke's conviction repeatedly expressed that while a few men attain excellence by virtue of their natural endowments, most men, nine out of ten, are what they are by virtue of their education, that is, by virtue of the training and discipline they have received. Furthermore, education appears powerless to alter the natural capacity or "original tempers." It may mend them a little and turn them to account and use.

It is such ideas that Locke carries through in his program for the education of a gentleman. First, a sound basis should be laid by training him as a child in healthful habits of cleanliness, exercise, eating, and sleep. Children should be hardened by robust treatment and not softened by delicacies and refinements. Yet they should not be harshly managed. Severe punishments and especially "beating" should be reserved for obstinate disobedience and untruthfulness. To health are to be added "virtue, wisdom, breeding, and learning." Virtue is placed first. "This is the main point, and this being provided for, *learning* may be had into the bargain, and that, as I think, at a very easy rate, by methods that may be thought on" (Sec. 147). These methods are epitomized in the following passage from *The Conduct of the Understanding* (Sec. 6). "The faculties of our souls are improved and made useful to us, just after the same manner as our bodies are. Would you have a man write or paint, dance or fence well, or perform any other manual operation dexterously and with ease, let him have never so much vigor and activity, suppleness and address, naturally, yet nobody expects this from him unless he has been used to it, and has employed time and pains in fashioning and forming his hand or outward parts to these motions. Just so it is in the mind: would you have a man reason well, you must use him to it betimes; exercise his mind in observing the connection of ideas, and following them in train. Nothing does this better than mathematics, which therefore I think should be taught all those who have the time and opportunity, not so much to make them mathematicians, as to make them reasonable creatures." It is well also that the young gentleman should learn a trade, "a manual trade; nay, two or three, but one more particularly" and not so much for the trade's sake as for useful diversion in his leisure hours. Throughout the whole work there is repeated counsel to consult the interests, taste, inclination, and capacity of those who are taught, to treat them with consideration and kindness, and to make their education more of a natural enjoyment than an unwelcome task. Yet the principal ideas are the training and discipline of man's natural powers through the formation of proper habits, rather than through the acquisition of knowledge; and the insistence that man is fitted by his faculties for a life of moral usefulness rather than for a life of inquisitive research into all that is knowable.

As already noted, the *Thoughts* concerns primarily the education of a gentleman, and nearly all Locke's writing on education has the gentleman in mind. It is interesting, however, to discover that while holding the post of Commissioner of Trade and Plantations he drafted a scheme of "Working Schools" for the children of paupers. The plan was prepared in order to relieve the burden of maintaining poor families at public cost, but was never put into practice. J. E. W.

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LOCKERS, SCHOOL. — See ARCHITECTURE, SCHOOL.

LOG COLLEGE. — A term frequently applied to institutions of higher learning erected on the frontier of American civilization during the eighteenth and early nineteenth centuries. Such institutions were usually of academic or secondary grade, but frequently developed into institutes of collegiate grade. The most notable of these was the institution founded by Reverend William Tenant, a Scotch Presbyterian divine, at Neshaming, near Philadelphia, Pa., in 1726. The school grew out of the instruction which Tenant gave his four sons. Opposition from the authorities of the Presbyterian Church sprang up, when Tenant and his four sons became adherents of Whitefield and the "New Lights" movement. While the "Log College" ceased to exist at Tenant's death (1746), the controversy which he initiated and his sons carried on resulted ultimately in the founding of Princeton University (*q.v.*).

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LOGARITHM. — The common logarithm of a number is the exponent by which 10 is affected to produce the number. Thus $10^2 = 100$, hence the logarithm of 100 is 2. Similarly, $10^{0.30103} = 2$, approximately, hence the logarithm of 2, to five decimal places, is 0.30103. We indicate these relations by the following symbolism: $\log 100 = 2$, $\log 2 = 0.30103$. In these cases we have taken 10 as the fixed number to be affected by the exponent, but we might take other numbers, and in higher analysis it is more convenient to take a certain one which is represented by e, and which equals (to five decimal places) 2.71828. In general, therefore, the logarithm of a number is the exponent by which a certain number (called the *base* of the system of logarithms) is affected to produce the number.

Use of Logarithms. — Logarithms are designed to aid in numerical calculation. Since $10^a \cdot 10^b = 10^{a+b}$, we see that the logarithm of a product is equal to the sum of the logarithms of the factors. This is evidently true if we take another base than 10, since $e^a \cdot e^b = e^{a+b}$, and so for any other number than e. Likewise we have $10^a \div 10^b = 10^{a-b}$, and $(10a)^b = 10^{ab}$. Hence if we have a table giving the logarithms of numbers, and the numbers corresponding to the various logarithms (the antilogarithms, as they are called), we can reduce the operation of multiplication to that of addition, division to that of subtraction, raising to powers to that of multiplication, and extracting of roots to that of division. In engineering work, and indeed wherever extensive computation is needed, logarithms are an important aid. The increase in numerical tables of late years, the remarkable development of the calculating machine, and the improvements in graphic methods, have tended to restrict the use of logarithms somewhat.

History of Logarithms. — The exponential relation which first suggested logarithms was doubtless $a^m \cdot a^n = a^{m+n}$, a relation known as far back as the time of Archimedes (*q.v.*). By the end of the fifteenth century it was recognized that, in a series like 2, 4, 8, 16, 32, $\cdots$ the product of the second and third terms is the fifth (2+3=5). Chuquet (1484) speaks of it, and says, in his quaint French: "En ceste consideracion est manifeste ung segret qui est es nomvres proporcionalz." The principle is more clearly stated by Stifel (1544), but it had already appeared in print in such works as those of Clichtoveus (1510), Grammateus (1518), Rudolff (1526), and Gemma Frisius (1540). After Stifel's work appeared, the significance of the principle, as he elaborated it, was noted by several writers, including Tartaglia, Ramus, Schonerus, Suevas, Clavius, and Peletier. Thus the fundamental principle was known long before the need for logarithms led to their final realization. It was the great development of trigonometry, beginning with Regiomontanus in the fifteenth century, that created the demand that brought about the invention. The necessity for handling the large numbers found in the series of natural functions rendered some improvement in calculation necessary, and it was this need that developed the new system.

It is possible that the first idea of a tabular arrangement may have occurred to Jost Bürgi (Justus Byrgius), a Swiss mathematician. At least we infer this from a statement made by Kepler in 1627. He constructed what was essentially a table of antilogarithms, which was published some years after John Napier issued his *Mirifici Logarithmorum Canonis Descriptio* (Edinburgh, 1614). The first mathematician to recognize the great value of Napier's invention was Henry Briggs, later Savilian professor of Geometry at Oxford. He visited

Napier in 1615, and suggested the practical value of 10 as a base of a system of logarithms. Napier had not used this base, nor had he used the base of the so-called hyperbolic (natural, Naperian) logarithms, which were invented by John Speidell (*New Logarithmes*, London, 1619). The logarithms of Napier are connected with the latter by the relation

$$\log_n a = 10^2 \cdot \log_e 10^2 - 10^2 \cdot \log e^n,$$

where $\log_n a$ is the logarithm of a in his system, and e is the base of the system invented by Speidell.

Logarithms immediately attracted wide attention. Vlacq published some extensive tables at Gouda in 1628; and these were reprinted in England in 1631. Faulhaber printed some tables at Frankfort, in his work on engineering, in 1630; and by 1646 the subject had found a place in a prominent English arithmetic (Hartwell's edition of *Recorde's Ground of Artes*).

Logarithms in the School. — The practical use of logarithms is easily taught, and from the standpoint of difficulty there is no reason why it should not enter into the curriculum of the elementary school. There is, however, the question of the need for the subject that may be felt by the student. Logarithms are means to rapid approximate calculation; they are indispensable to successful work in trigonometry and its applications, and they are helpful in the practical computations of mechanics and engineering. They are not, however, practically used in ordinary business life, and the fact that they require a table renders them unavailable for mere occasional computations. The pupil does not, therefore, experience a need for logarithms in the elementary school, at least as the subjects are arranged in the United States to-day. If computations in physics and mechanics should enter earlier in the American high school, the subject could easily be taught in the first year (the pupil's ninth school year), and with the growth of industrial classes this will probably come to be the case. For the high school course in mathematics leading to advanced work, however, there is at present no reason for thinking that the subject should be presented until the need is felt in trigonometry. Indeed, for the industrial classes the slide rule (see MECHANICAL CALCULATION) will probably take the place of logarithms to a large degree; although, being based upon the latter, these will need to be taught to some extent in any case. D. E. S.

LOGIC. — The science (or art) of correct thinking. All schools of logicians would probably formally agree in this definition. It does not, however, imply anything concerning the nature of thinking, and hence nothing concerning the criterion of its correctness. Since modern philosophy has had for one of its chief points of debate the nature of thought, and the relation of thought on one hand to existence and on the other hand to knowledge, the matter of the scope, limits, and purpose of logic have been thrown into the greatest uncertainty, not to say confusion. By a curious way, this result is largely the work of Kant, who himself proclaimed logic to be the one instance of a perfected and completed self-inclosed science. By logic he had in mind formal logic, or the logic of reasoning resting on the canons of identity, contradiction, and excluded middle; essentially as formulated by Aristotle. But Kant himself introduced the conception of a type of thinking which was not merely formal, but constitutive in some respects and regulative in others, and thus brought the nature of logic within the region of disputed questions in epistemology.

Antiquity. — Logic was first recognized as a branch of the higher education at Athens in the period subsequent to Aristotle. The founding of the philosophical schools in the fourth century, and the "analytical" inquiries of Aristotle, afforded the preconditions; the one provided the earliest institutional teaching of academic rank, the other first gave to logic formal existence as a science. But it was in an altered and much simplified form that the logic of Aristotle finally became established — probably during the course of the second century — as one of the circle of studies (ἐγκύκλια παιδεῖα) which every liberally educated Greek might be presumed to know.

A long process of intellectual and educational differentiation, during which Greek philosophy reached and passed its zenith, issued in the gradual detachment of distinct disciplines. The separating out of logic from the common content exhibits recognizable stages: (*a*) An implicit logical discipline had lain embedded even in the ancient "music," which was esteemed by the Greeks and defended by Plato expressly on the ground of its value in organizing and regulating the mental life. (*b*) The fragmentary logical methods practiced, and probably to some extent formally taught, by the younger Eleatics, the Megarians, but above all by the sophists, rhetors, and by Socrates, provided instruction and exercise in logical argumentation, the educational effect of which, direct and indirect, was undoubtedly great. (*c*) Mainly through the instrumentality of Socrates and Plato, the sophistic movement of the fifth century clarified itself, issuing in the settled opposition of rhetoric and philosophy, which thereafter remained the staples of higher education down to the close of the Græco-Roman period. (*d*) Later, at the hands primarily of Aristotle, philosophy received articulation into the disciplines which have been permanently recognized. The position accorded to logic, that of a propædeutic to philosophy, on the ground that it deals only with the form or method of knowledge, was decisive in determining both its content as a science and its status as a subject of instruction until well into the modern era. With the exception of the ontological implications of the work on the *Categories* and commentaries thereon, it consistently excluded metaphysical questions. Its instrumental character, moreover, coöperated with the internal relations of content to fix its position as one of the group of preparatory formal disciplines, later distinguished as the *trivium.* (*e*) With the post-Aristotelian subdivision of the whole of philosophy into logic, physics, and ethics, the content traditionally known in modern times as formal logic became a subordinate part of the first division under the name of dialectic. But the coincidence of formal logic and dialectic was not at first complete. For the Stoics, whose influence was paramount in further determining the form in which logic passed into education, first divided logic into rhetoric and dialectic, distinguished on purely external grounds as the arts of continuous discourse and of discussion, and then divided dialectic into the doctrines of thought, or meaning, and words (*in res, quae dicuntur, et vocabula, quibus dicuntur*, as Seneca expresses it). The former alone corresponds, roughly, with the formal logic of later times. Hence the dialectic of the Stoics included much which was later assigned to grammar. Formal logic never quite freed itself, however, from entanglement with questions of language, a fact for which Aristotle must share the responsibility, since in the *De interpretatione*, extensively used as a text in the Middle Ages, he fails clearly to distinguish between the thought or judgment and its expression in language. Further evidence of the dominant influence of the Stoics appears in their important contributions to the terminology of the science (including the name " logic "), in the permanent retention of a number of their distinctions and divisions, and in the instances of historical connection between the introduction of the study of dialectic and contact with Stoic philosophers or writings.

Two virtually opposed conceptions of the aims and scope of logic, which profoundly affected both its future development and its relation to education, were present in germ from the outset. On the one hand, Parmenides, in explicitly recognizing the distinction between knowledge and opinion, laid the foundation for the conception of logic as an objective science embracing the methods of attaining necessary truth; on the other, his follower, Zeno, in contenting himself with exhibiting the contradictions to which the tenets of their opponents led, inaugurated the treatment of logic as an instrument of controversy. Parmenides' principle that what can be thought can be, *i.e.* that truth and reality are to be determined by consistency or the necessary in thought, found further development in the Socratic discovery of the universal element in knowledge, forming the content of a definition, in Plato's principle that universal and necessary knowledge presupposes immutable being, and in Aristotle's formulation of the principles of theoretical demonstration (ἀπόδειξις); Zeno's employment of the principle of contradiction with a polemical aim led to the eristic of the Megarians, to the forensic argumentation and sophistic dialectic of the sophists and rhetors, and to the rhetorical logic of later times.

The two conceptions are not as such mutually exclusive; the factual divergence arises from the supplanting of the theoretical by some practical aim; historically they have been on the whole antagonistic, and have tended to displace one another. Their nearly parallel development may be traced, as indicated, down to the decline of Greek thought in the Macedonian period, after which logic as an instrument of the disinterested determination of truth fell into abeyance until the revival of learning and the birth of the modern era. Aristotle marks the turning point. The culmination in him of the development of logic as an objective science was followed by its complete subserviency to practical aims. For while the elder Peripatetics maintained the distinction between apodictic and dialectic, it proved to be barren, since they failed to grasp the distinctive character of logical thought; and, with the Stoics, who transmitted logic to the Græco-Roman curriculum, even the distinction disappeared. In the *Organon* both conceptions receive their just dues. Apodictic (with syllogistic), the method of strict syllogistic demonstration proceeding from proved premisses or from self-evident first principles (*Prior* amd *Posterior Analytics*), is fundamental, and is opposed to dialectic in all its forms. Yet dialectic as such is not to be rejected, but distinguished as legitimate and illegitimate; and to the former is assigned the place of a subsidiary art. In his *Sophist*, Aristotle credits Zeno with being the "inventor" of dialectic, meaning thereby "the art of arguing, not from true premisses, but from premisses admitted by the other side" (Burnet). Aristotle's own treatment of dialectic, in the *Topics* and elsewhere, is a comprehensive critical presentation exhibiting the historical progress. Properly, dialectic is an auxiliary logical method, viz. the critical examination of the truth of an opinion by means of discussion, involving the viewing of it from all sides; its insufficiency arises from its proceeding from merely probable premisses, or commonly accepted opinions, instead of from premisses which have been shown to be true; it therefore yields at the best only probable conclusions. Sharply distinguished from legitimate dialectic is the perverted or rhetorical dialectic which aims, not at discovery of the truth, but merely at victory over an opponent. Still further removed from the conduct of discussion for theoretical ends are the degenerate types of dialectic known as (1) *eristic*, which is unduly contentious and satisfied with the mere semblance of victory, and (2) *sophistic*, which implies the deceptive use of logical forms, particularly of concealed fallacies, with a view to creating the false appearance of knowledge, for the sake either of reputation or of pecuniary gain.

With the decline in theoretical interests and in constructive power in the Hellenistic period, the prolonged conflict between philosophy and rhetoric, of which the opposition between apodictic and dialectic may be regarded as a principal phase (the incomplete differentiation is manifest, not without irony, in the claim of Isocrates, repeated later by Quintilian, that rhetoric is philosophy, as well as a complete education, and gives an adequate insight into human affairs; while Aristotle, by sharply distinguishing the two at the same time that he taught both, prepared the way for their definite separation), culminated so far as the Greek schools were concerned, leaving rhetorical logic and the individualistic systems of morals as the principal representatives of philosophy. The same dominance of practical aims which narrowed logic to the *ars disserendi* extolled by Cicero, favored the assembling of the constituent disciplines of "encyclical" or general education in compendious form. The lost work of Varro, *Disciplinarum libri novem*, which apparently epitomized the contents of the current Greek education, was the first encyclopedic work in Latin. Encyclical education, the precursor of the curriculum of the Seven Liberal Arts (*q.v.*), gradually established itself throughout the Græco-Roman world, including the pagan and Christian schools of Alexandria. By the time of Quintilian it more definitely attained the status of a propædeutic to professional study, whether of rhetoric, philosophy, medicine, or jurisprudence. Though the list of the liberal arts did not become finally fixed in premedieval times, logic in the form of dialectic usually appeared as one of the disciplines of the encyclical curriculum. Both Quintilian, in his account of *orbis ille doctrinæ*, and Seneca (*Ep.* 88) omit it by name. But they probably considered it as merged with rhetoric; if so, the fact is a significant commentary on the educational position of logic at the time.

The content of the dialectic of the Græco-Roman curriculum can be only conjecturally inferred, and with much uncertainty, from (1) the later Latin manuals, probably based to some extent on Greek models, and (2) the current logic of the philosophical schools, particularly that of the Stoa. It probably included the principal topics found in later formal logic, presented in the most elementary and formal manner. But it should be borne in mind that, while the constructive study of logic, so long as it continued, must always have been confined to the esoteric circle, large numbers of students in all the universities of the Græco-Roman world, including, after *c.* 100 B.C., the whole body of the ephebes, attended less technical lectures, which, however, provided, certainly in many cases, a much more adequate treatment of logical doctrines than did the dialectic of the later preparatory curriculum.

Middle Ages. — When education passed into the custody of Christian institutions, the principal task, next to that of educational organization, was the appropriation and transmission of an already evolved educational content. In this process, dialectic, destined later to become the chief discipline of the trivium, was slightly broadened by the partial restoration of its Aristotelian form. Two modifications made by the Stoics, their treatment of the hypothetical syllogism as typical, and their reduction of the categories to four, failed to pass into the medieval tradition. On the other hand, the really important labors of Theophrastus and Eudemus in developing the theory of hypothetical and disjunctive syllogisms, bore permanent fruit. But this advance fell within the Aristotelian framework.

The definitive inclusion of dialectic in the curriculum of the Seven Liberal Arts insured it a permanent place in medieval education. Until the middle of the twelfth century, its content remained unaltered as fixed by a limited number of texts. The origin and scope of these texts may be briefly indicated: (*a*) A less widely known source of some importance was the spurious third book, attached to the *De dogmate Platonis* of Apuleius, a north African rhetorician of the second century, A.D., entitled *De philosophia rationalis*, which there is internal evidence to show was industriously consulted by Capella. It is a strange magma of Stoic and Peripatetic logic; the discussion includes categorical and hypothetical judgments, quantity and quality and parts of propositions, their opposition, conversion, and contraposition the predicables (the Aristotelian list), the three Figures of syllogism (the addition of the Fourth Figure was first ascribed to Galen, on the authority of Averroës, in the sixteenth century), the nineteen moods of Theophrastus, and indirect proof. (*b*) The influential *Introduction to the Categories of Aristotle* (*Eisagoge*) by Porphyry (232–304), a Neoplatonic commentator on Aristotle, should be assigned to the medieval texts, since its effect on education fell subsequent to its translation into Latin by Boethius. The elaborate discussion of the predicables (*quinque voces*), as tending to equate all logical procedure with division into points of view, added materially to the preponderance of the *Topics* and of the merely formal and dialectical character of early medieval logic. (*c*) The fragment, *Principia dialecticæ*, attributed to St. Augustine, which formed part of an unfinished encyclopedia of the liberal arts founded on Varro's *Disciplinæ* and begun in 387, was very limited in content, and owed its vogue as a text mainly to the ecclesiastical prestige of its author. It defines logic as *scientia bene disputandi,* and contributed its share to the rhetorical tendencies of medieval logic. The pseudo-Augustinian text, *Categoriæ decem ex Aristotele decerptæ,* a contemporaneous work, was confined to a translation, paraphrase, and commentary. Its educational importance lies largely in the fact that Alcuin borrowed from it nearly one half of his dialogue on *Dialectic.* (*d*) The most extensively used of medieval texts on logic, and often the only text used, was the *De dialectica,* forming the fourth book of the fantastic allegory of Martianus Capella, entitled the *Marriage of Mercury and Philology.* Written in northern Africa, *c.* 420, this was the first encyclopedia of the seven liberal arts which has been preserved entire. The plan of the work was taken from Varro, while its content was compiled from various sources, the part on dialectic being drawn mainly from Apuleius and Varro. It presents several additional features familiar in later formal logic: Definition, division, and partition; univocal and equivocal, categorematic and syncategorematic terms; the ten categories of Aristotle; categorical and conditional syllogisms, the former in nineteen moods, the latter in the hypothetical and disjunctive forms and moods. With the exception of fallacies, no chief part of early medieval logic is now wanting; and, as against the Stoics, there are the minor restorations of Aristotle already indicated. (*e*) Much the most prolific contributor to the stock of medieval texts on logic was Boethius (*c.* 480–524), " the last of the learned Romans," (Sandys) whose numerous translations and commentaries transmitted to the Middle Ages the *Organon* of Aristotle. Unfortunately the versions of the more important treatises, viz. the *Prior* and *Posterior Analytics,* the *Topics,* and the *Sophistici Elenchi,* remained unknown until about the middle of the twelfth century; while those which early passed into the service of the schools, because they had been provided with commentaries, viz. the versions of the *Categories,* the *De interpretatione,* and the *Eisagoge* of Porphyry, together with the corresponding commentaries, including that on the *Topica* of Cicero, and the original logical treatises of Boethius, all on the whole tended to accentuate the interest in merely formal distinctions rather than to broaden the scope of logical inquiry and instruction. There is one conspicuous exception. Porphyry, in the first paragraph of the *Eisagoge,* quite incidentally, be it remarked, raises the logico-metaphysical question respecting the real existence of genera and species which chanced to provoke the great medieval controversy between the realists and nominalists as to the nature of universals. (*f*) Cassiodorus (*c.* 485–*c.* 580), who, after serving the Ostrogothic dynasty thirty years, founded two monasteries and devoted the remainder of his long life to Christianity and to the preservation of pagan learning, and Isidore (*c.* 570–636), Bishop of Seville, both produced encyclopedias of the seven liberal arts which greatly promoted the introduction of the classical disciplines into Christian education and further determined their early medieval form. One half of the *De artibus ac disciplinis liberalium litterarum* of Cassiodorus, written in 543–555, is devoted to dialectic; while the *De arte dialectica* of Isidore forms, with rhetoric, Book II of the *Origines* or *Etymologiæ,* the first encyclopedia in the modern sense. Cassiodorus' *De dialectica* is a confused compilation, derived principally from Boethius, Apuleius, and Porphyry, but characterized by the prominence given to definition, the syllogism, and probable reasoning, *i.e.* to the parts of logic most serviceable in rhetorical argumentation. Isidore's treatise, which is mainly a patchwork of verbal reproductions from Cassiodorus, was largely responsible for transmitting to the medieval tradition the rhetorical elements in Cassiodorus which are not found in Capella.

The above body of texts in school logic, together with the dialogue *De dialectica* of Alcuin (*c.* 735–804), the pertinent chapter in the *De clericorum institutione* of Hrabanus Maurus (*c.* 776–856), and the German translations of Capella and Boethius by Notker Labeo (*d.* 1022) of the monastery of St. Gall, constituted throughout the early medieval centuries a relatively fixed apparatus for logical instruction.

From the middle of the sixth century to the rise of the universities in the twelfth and thirteenth centuries the monastic, cathedral, and college schools were in control of higher education. Throughout this period dialectic steadily rose in educational importance. Its utility in the defense of Christian doctrine was early manifest, and as the great problem of organizing the faith of the Church into a rational system pressed for solution and drew to itself all the intellectual energies of the time, logic became not merely indispensable, it was supreme. Thus a twofold characteristic of the position of dialectic in the Græco-Roman period is repeated: it was now the instrument of theology, as it had been that of oratory; and now, as then, it was wholly enlisted in the service of practical aims, since it was devoted to the organization and defense of a fixed traditional content, rather than to a disinterested inquiry into a body of objective truth. It was natural that in a theological age the *artes sermonicales* of the trivium should be more highly esteemed than the *artes reales* of the quadrivium (a circumstance possibly not unconnected with the fact that Alcuin wrote on the trivium only); and within the trivium itself, while grammar long held undisputedly the first place, and rhetoric and dialectic contended for the second, later dialectic first definitely triumphed over rhetoric, and then finally penetrated even grammar with its own principles, forcing upon it its terminology, and converting it into a speculative science (*littera sordescit, logica sola placet,* John of Salisbury). Accordingly, at leading monastic and cathedral schools, such as Paris, Tours, Rheims, Chartres, Fulda, Reichenau, and St. Gall, particularly after the intellectual awakening which began with the eleventh century, the study of logic, including disputation, was prosecuted with much zeal and enthusiasm, and claimed an ever-increasing allotment of time. After the rise of scholasticism, the leaders in the famous controversy over the substantial existence of universals, — Eriugena, Roscellinus, St. Anselm, William of Champeaux, Abélard, Albert the Great, Thomas Aquinas, Duns Scotus, and Occam (*qq.v.*) were *ipso facto* immersed in problems which were at once logical and metaphysical; yet on the whole the Aristotelian tradition which excluded logic from philosophy remained unshaken. Gerbert (*c.* 950–1003), master at Rheims and at Paris, and later elevated to the papal chair, and Gilbert de la Porrée (*c.* 1075–1154), chancellor at Chartres, are examples of celebrated teachers of logic whose logical writings (*De rationalis et ratione uti* and *De sex principiis* respectively) exhibit the prevailing interest in the ontological implications of logical problems, and yet evidently are not designed to mark any departure from the time-honored separation of logic from philosophy. The latter work, in fact, was later frequently included in the earliest Latin editions of the *Organon.*

Coincident with the intellectual expansion of the twelfth century, and contributing largely to it, was the remarkable discovery, by the Western world, of the remaining works of Aristotle. The Venetian translation by Jacobus Clericus (1128) apparently did not at once become generally known. Adam du Petit-Pont discussed the *Prior Analytics* as early as 1132. But it was Theodoric of Chartres (whose *Heptateuchon,* completed in 1141, contained all of the *Organon* except the *Posterior Analytics* and the second book of the *Prior Analytics*) who first introduced the long forgotten logical treatises into the schools. This we know on the authority of John of Salisbury (*Metalogicus,* 1159), who also explains that the *Posterior Analytics* were omitted because of their difficulty. It is clear that he was acquainted with the whole of the *Organon.* Gilbert cites the *Analytics* as generally known, while his pupil, Otto of Freising (*d.* 1158), introduced the recovered treatises into Germany, possibly in the Boethian versions. By the middle of the twelfth century, accordingly, the newly discovered and more important part of the *Organon,* consisting of the *Topics,* the *Prior* and *Posterior Analytics,* and the *Sophistici Elenchi,* had become widely known. Thereafter, for centuries, the two groups of the logical treatises were distinguished as *nova logica* and *vetus logica.* And on the addition of the *Physics, Ethics,* and *Metaphysics,* about 1200, the "new Aristotle" was recognized. Latin translations from the Arabic (or Arabic through Syriac) versions of the Greek originals, which had found their way into Europe on the Moorish conquest of Spain, — translations which were produced by a college of translators at Toledo, and included also the extensive commentaries of Avicenna, Averroës, and others — were in the first half of the thirteenth century a very important although not pure source of further knowledge of the Aristotelian writings. Later Latin versions, made direct from the Greek, were rightly regarded by the great medieval Aristotelians as the more trustworthy.

It is not surprising that the effect produced upon the medieval mind of the twelfth and thirteenth centuries by the "new Aristotle" was almost startling. But the widening of the intellectual horizon, and the further stimulus given to the already over-subtle tendencies of thought, did not produce a change of attitude. Acquaintance with the Aristotelian apodictic, with the principles of theoretical demonstration and of the ultimate self-dependence of thought, resulted rather in merely adding to the resources of theological argument and in carrying to completion the scholastic edifice. The organization of education witnessed, however, one general effect of some consequence. Gradually, in addition to the traditional liberal arts, philosophy came to be recognized as providing a second stage in the preparatory training for theology.

The founding of the universities (*q.v.*) brought with it the apotheosis of logic. The curriculum of the faculty of arts, later called the faculty of philosophy, because of the commanding position occupied by logic and philosophy, was at the outset a continuation on a slightly higher plane of the arts curriculum of the monastic and cathedral schools. The comparative neglect of the *artes reales,* already noted, on the whole continued, notwithstanding the stirrings of a new scientific interest manifest in such sporadic phenomena as the appearance of a Roger Bacon in the thirteenth century; classical studies, despite the vigorous defense of the "authors" as against the arts at Chartres and Orleans (Henri d'Andeli, *Battle of the Seven Liberal Arts; c.* 1250), failed to gain a foothold; rhetoric languished, and grammar became dialecticized; the lion's share of the curriculum accordingly fell to logic and philosophy; and if we consider that the numerous minor Aristotelian treatises in natural philosophy were at that time regarded as a constituent part of philosophy coördinate with ethics and metaphysics, it would be hardly too much to say that, for the space of a century and a half following the triumph of Aristotle at Paris, as signalized by the university statutes of 1254, logic and philosophy between them comprised nearly the whole of the arts curriculum at the northern universities. The time allotted to logic, including disputations (*q.v.*), apparently ranged at different universities and at different times from a maximum of about three quarters of the whole (University of Toulouse, time-table of 1309, exclusive of grammar: see Paetow) to a minimum of about one third (Leipzig, time-table of 1519: see Norton). The textbooks on logic prescribed in the various university statutes regularly included both the "new" and the "old" logic; the latter always embraced the *Eisagoge* of Porphyry, as well as the *Categories* and *On Interpretation* of Aristotle, and frequently also the *Divisions* and *Topics* of Boethius, and the *Six Principles* of Gilbert de la Porrée. But the difficulty of these treatises for youths of fourteen called into existence a large number of adaptations and abridgments, by far the most celebrated of which was the *Summulæ logicales* of Petrus Hispanus (*d.* 1277), now known not to have been a translation from the Greek of Psellus, but itself the original of the Greek *Synopsis*, etc., of Georgios Scholarios (1400–1464). This work reigned in the schools for two and a half centuries, and passed through innumerable editions. The first six tractates summarize the logical treatises of Aristotle and Boethius, *i.e.* the main body of logical doctrines known by the middle of the twelfth century, now designated as *logica antiqua;* whereas the seventh tractate, entitled *De terminorum proprietatibus* (*Parva Logicalia*), sets forth a group of modern additions, distinguished from the foregoing as *logica moderna.* The content of the *Parva Logicalia* offered a premonitory symptom of the coming excesses of scholastic thought. It presented a body of formal logical distinctions, semi-grammatical in character, and recalling vividly the Stoic doctrine of words (see above). When the prestige of Aristotle began to wane in the fourteenth century, logic yielded something of its position in the curriculum to other subjects; but the real loss lay in the incipient decadence, in the over-refinement of conceptual distinctions, the quibbling subtleties which later brought such discredit to the schoolmen. In the last phase of medieval logic, accordingly, *a priori* formalism divorced from the test of fact exhibited those excesses which led to the inevitable revulsion.

Modern Era. — The modern era begins with the recovery of the self-dependence of thought. The new spirit manifested itself in the rejection of authority and tradition, in the free appropriation of the treasures of antiquity, in the new interest in nature, and in the search for knowledge by direct and disinterested inquiry. The share of logic in this movement was not primary, but a consequence of the new attitude in metaphysics and epistemology. The result was none the less important; the way was opened to restore to logic the character of a theoretical science, and eventually to raise it to the position of a constituent part of philosophy itself. Yet these changes came but slowly, and, down to the eighteenth century, they were reflected in academic practice only after their consummation in the world of letters.

A distinction should be recognized between the more elementary instruction in formal logic, which has been provided for throughout the modern period in the curricula of the upper forms of higher schools (gymnasia, lycées, and colleges) as well as in universities; and the larger treatment of logical problems in advanced university courses. In the former the ancient and medieval traditions long maintained themselves without radical innovations; in the latter, the development of logical doctrines followed the main currents of modern philosophy in the rationalistic, empirical, and critical directions, but produced only an indirect and very limited effect upon instruction. It should also be remarked that the relative prominence of logic in the modern as compared with the medieval curriculum has been inevitably greatly reduced.

The first reforms were those attempted by humanists of the early Renaissance. Their attacks were directed against the summulist logic and in general against the scholastic Aristotle. The characteristic revival of classical authors asssumed in their hands the form of a restoration of the Roman rhetorical logic. These features are variously exhibited by Valla (1407–1457), whose textbook, *Dialecticæ disputationes contra Aristotelicos*, first printed in 1499, is based on Cicero and Quintilian, and is at once a *scientia rationalis et sermonicalis;* by Agricola (1442–1485), who sought to attain from Aristotle's own writings a purer Aristotelianism, and whose rhetorical *De inventione dialectica*, drawn from Aristotle, Cicero, and Quintilian, was praised and laid under contribution by Melanchthon; by Vives (1492–1540), a true modern, in whose *Pseudo-dialektiker* (1519) the sins of the scholastic logic are relentlessly exposed, and whose encyclopedic work, *De disciplinis* (1531), contains a strong plea for a purely formal logic freed from metaphysics and based on the nature of thought; by Ramus (1515–1572), the "Abélard of French humanism" (Ziegler), whose *Animadversiones in dialecticam Aristotelis* (1534) sought the reform of logic by taking, not the *Organon*, but the innate logic of the human mind, as the final authority, and whose *Institutiones dialecticæ* (1543), going back to the Ciceronian *ars disserendi*, merged logic with rhetoric, and introduced an order of topics long followed in the handbooks, viz. Pt. I, *De inventione*, treating of the concept and definition, and Pt. II, *De judicio*, treating of judgment, syllogism, and method; by Melanchthon (1497–1560), who brought Luther to consent to a new Aristotle in education, who included the trivium in the Saxony School Plan for Latin schools (1528), which laid the foundation for the modern German gymnasium, and whose widely used compendia on logic (*int. al.*, *De dialectica libri IV*, 1528; *Erotemata dialectices*, 1524) became the basis for many logical textbooks attempting to reconcile Aristotle with the Ramists and humanists. It was perhaps symptomatic of the general antagonism to Aristotle that Ramus' really unimportant attempt at a reform of logic enjoyed so great vogue. The Ramist stronghold was France, where a long and bitter conflict raged between the Ramists and Antiramists; but, favored by Johann Sturm (*q.v.*), whose carefully organized and historically influential Strassburg curriculum included dialectic in the two upper forms, Ramism spread into Germany; while among the evidences of its introduction into England are the traces of its influence on Milton's *Tractate on Education.* It was not finally displaced until superseded by Cartesianism.

The recovery of an objective logic, aiming solely at determining the truth, came in principle with Francis Bacon and Descartes. With the former, the emphasis is upon the control of thought by fact; with the latter, it is upon demonstration by the necessary implications of concepts. But the influence of neither upon instruction in logic was direct or immediate. Bacon's insistence upon observation of the actual course of nature, his contention that the syllogism could represent no more truth than the experiential knowledge contained in its component ideas, found expression in the realism of Ratke (*methodus nova*) and Comenius (*Great Didactic*, which provided for logic in the curriculum of the Latin schools); while his eloquent advocacy of the primacy of induction, and his services, following upon Roger Bacon, da Vinci, Telesius, Galilei, and others, in advancing the formulation of its principles, were a potent stimulus to the future development of inductive logic, and contributed in a quite incalculable degree to the promotion of its study. Descartes' own *Discours de la méthode*, indeed, appeared in French secondary curricula after the opening of the eighteenth century; but of far greater importance for logic was the production by two Cartesians, Arnauld and Nicole, of the celebrated Port-Royal *La logique ou l'art de penser* (1662), which they based upon a tractate of Pascal. This skilfully written handbook, which found high favor in France for nearly a century and was translated into several foreign languages, combined Descartes' rules of method and views on knowledge with a simplified and modified Aristotelian logic.

Of considerable interest was the methodological effort made at this time to deduce the content of logic from fundamental principles, or, at least, to organize its material under the laws of thought regarded as postulates. The first example is the Cartesian Geulincx, who sought (*Logica fundamentis*, etc., 1698) to construe logic by recognizing affirmation as its specific principle. Leibniz, as is well known, added to the principle of identity that of sufficient reason, declaring these to be the highest principles of knowledge. Later, Reimarus (*Vernunftlehre*, 1756) and Twesten (*Logik: Analytik*, 1825), among others, made systematic efforts to exhibit logic as the theory of the application of the principles of identity and contradiction to concept, judgment, and inference. The laws of thought have come to be regarded, in a sense not often adequately defined, as the supreme principles of formal logic.

The ontological or metaphysical logic of Kant and his successors, which for the first time since the Dialectic of Plato exalted logic to the position of the fundamental philosophical discipline, was limited in its effect upon instruction to the advanced university courses of the critical idealists and their followers, and to the remote but not unimportant neo-Hegelian movement at Oxford, from which issued Wallace's translation of *The Logic of Hegel*, Bradley's *Principles of Logic*, and Bosanquet's *Logic, or the Morphology of Knowledge*, works which, directly and indirectly, have exerted considerable influence upon the content of recent English and American university courses and textbooks.

The development of induction through Newton's *Regulæ* prefixed to the *Principia*, Herschel's *Discourse* (1832), Whewell's *Philosophy of the Inductive Sciences* (1840), Mill's *A System of Logic* (1843), and Jevon's *Principles of Science* (1874), led to another line of influence on academic instruction. Conceived on broader philosophical lines were the important and educationally influential works, all entitled *Logik*, of Lotze (1843), Sigwart (1873–1878), and Wundt (1880–1883), which combined with elaborate expositions of the methodology of scientific research a teleological idealism that sought to recover the historical form of the concept of evolution. Philosophically much less important, but serving as the model for innumerable English and American textbooks, was Hamilton's ultra-formal logic (*Lectures*, etc., 1859–1860; followed by Mansel, *Proleg. Logica*, 1851), which presented the Aristotelian analytic from the Kantian standpoint, treated concepts as fixed products to be mechanically combined and separated by thought, and proposed the quantification of the predicate, leading the way to symbolic logic. The mathematical or symbolic logic introduced by Boole (*The Mathematical Analysis of Logic*, 1847), which treated the proposition as an equation, thus laying the foundation for a logical calculus similar to the mathematical, and which was espoused by De Morgan (*Formal Logic*, 1847), Jevons (*The Substitution of Simi-*

lars, 1869), and Venn (*Symbolic Logic,* 1881), has not been academically of great significance.

It may be remarked, in conclusion, that the detached presentation of formal logic in academic courses is yielding to the inclusion of the essentials in the larger treatment of the general principles of knowledge.

W. S. H.

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LOGICAL METHOD. — The plan of procedure in developing school subjects may follow the sequence characteristic of an adult's thinking, in which case current pedagogical theory denominates it a logical method; or it may proceed by the more rudimentary and tentative units of a child's comprehension, in which case it becomes a psychological method. For example, in the subject of primary arithmetic the child may first master the topic of notation and numeration, then addition, subtraction, multiplication, division, and fractions in the order named; or he may learn as much of any or all of these topics as his immediate needs determine in the first attack, taking up the same topics again more thoroughly with each recurring presentation until each topic is thoroughly comprehended. In both types of treatment the final outcome is the same, the pedagogical distinction arising out of the differing modes of approach. Strictly speaking, a psychological plan is rational from the child's point of view, and a logical method is psychologically natural to an adult. The pupil's last view of the subject through the psychological plan of attack ought, then, to correspond with the adult's logical way of viewing the field.

Young children should at first be taught through a psychological procedure, one that adjusts to their own outlook and experience. Instruction will then be more vital, but the teacher needs constantly to keep in mind that the final point of arrival should bring the child to see his experience in the perfected logical arrangement of a mature scientific mind which takes account of all the facts and classifies accordingly. The traditional plan of schools is to proceed by the logical order; pedagogical reform lays emphasis on the psychological order; the actual effect in current practice is a modified psychological order. It is not always easy for the individual teacher to keep in mind what has been covered by a strictly psychological plan; it is still more difficult for the coöperating teachers of a graded system to know what a given instructor has accomplished for the child. In consequence there is a tendency, after several special treatments of a topic, to assign the thorough mastery of a topic to a given grade in order that responsibility for thorough work may be fixed at a given place, and that the tendency toward scattering and fragmentary results which accompanies a strictly psychological arrangement of the course of study may be overcome. Such a more manageable, mixed order is, however, dominantly psychological in its progression. H. S.

See Teaching, Method of; Method.

LOGISTICA. — See Arithmetic, History of.

LOLLARDS' SCHOOLS. — See Dissenters and Education.

LOMBARD COLLEGE, GALESBURG, ILL. — A coeducational institution chartered in 1851 as the Illinois Liberal Institute. The present title was adopted in 1899. Preparatory, collegiate, theological, and music departments are maintained. The entrance requirements are fifteen units. The courses in the college are divided into four groups, classical, modern, social science, and philosophy, leading to the A.B. degree, and science, leading to the B.S. The Divinity School confers the degree of B.D. The faculty consists of fourteen members. The enrollment in 1911–1912 was 92.

LOMBARD, PETER THE. — See PETER THE LOMBARD.

LONDON DAY TRAINING COLLEGE. — See LONDON, UNIVERSITY OF. J. D.

LONDON, EDUCATION IN. — **Historical.** — The history of London education for four hundred years is succinctly summarized in one of the earliest documents relating to it (*c.* 1118), the introduction to the *Life of Becket*, written by Fitzstephen, one of his clerks, who became a judge shortly after Becket's death. "In London the three principal churches have famous schools privileged and of ancient preëminence, though sometimes through personal favor to some one noted as philosopher more schools are allowed." The three principal churches to which these three schools were attached were St. Paul's Cathedral, St. Martin's-le-Grand Collegiate Church (now the General Post Office), and St. Mary-le-Bow Church, in Cheapside, to be born in hearing of the bells of which constituted, till these modern days of din which drown all bells, the true differentia of a "cockney" or Londoner-born. Many other churches have been queried as being those meant by Fitzstephen, the great Elizabethan antiquary, Stow, in his *Survey* going so absurdly wrong as to include St. Peter's school, Westminster, when there is no trace of any school before 1380, and St. Saviour's Abbey, Bermondsey, where no grammar or public school existed at all. Besides, each of these places was about two miles from London. Fortunately a contemporary document still extant at St. Paul's puts beyond doubt what the three schools were. This is a writ of King Stephen's brother, Henry of Blois, Bishop of Winchester, and acting Bishop of London during a vacancy of the see from 1138 to 1140, to the chapter of St. Paul's Cathedral and the Archdeacon of London commanding them by their obedience that after three warnings they launch the sentence of excommunication against those who without a license from Henry the Schoolmaster presume to teach anywhere in the whole city of London, except those who teach the schools of St. Mary of the Arch (or "bow") and St. Martin's the Great (or Grand). Just as the Chancellor of Notre Dame Cathedral at Paris always gave license to teach school, even when the School of Paris had grown into the University with its many schools, so the schoolmaster, afterwards called Chancellor of St. Paul's, was the licensing authority (see TEACHERS, LICENSING OF) for schools throughout London. St. Martin's-le-Grand was exempt because this was a collegiate church of canons like St. Paul's itself, founded before the Conquest, and enjoyed as all such collegiate churches of early foundation did, the right to keep a school, probably by special Papal and episcopal privilege. The church of St. Mary-le-Bow, belonging to the Archbishop of Canterbury, was exempt as such from the jurisdiction of his suffragan and subordinate, the Bishop of London, and was, in fact, the seat of Archbishop's Court, the Supreme Ecclesiastical Court of Great Britain, still called the Court of the Arches, from having been held among the arches on which (probably) the Church of the Arches or St. Mary-le-Bow was built.

St. Paul's school was, however, undoubtedly the oldest, as it was also the first in London. There can be little doubt that it was originally founded as part of the cathedral in 604 when King Ethelbert built "the church of St. Paul the Apostle, in which Mellitus and his successors might have their Episcopal see," and "added lands and possessions for the use of those who were the bishops." But London underwent at least two, if not more, lapses into paganism, and whether we can date the continuous existence of St. Paul's either as church or school any earlier than 886, when King Alfred "settled the borough of London," and all the English turned to him, is doubtful. The earliest known reference to the school is in a document of about the year 1111, by which the bishop of London informed the dean and chapter that he had granted to Hugh the schoolmaster to hold by virtue of the dignity of his mastership the house of his predecessor, Master Durand of the Church of the Belltower, and also the custody of the cathedral library, with the keys of the cupboards by the altar which the bishop had ordered to be made for the books. Of St. Martin's-le-Grand school the only specific mention apart from its appearance in connection with the other two is in a city letter-book, on Thursday before 24 August 1295, when a cap or hat-maker of Fleet Street entered into a recognizance to pay £5 to Master Hugh of Wytington, schoolmaster of St. Martin's-le-Grand; which recognizance was afterwards discharged when Hugh's brother and executor, Master John of Whittington, acknowledged payment of the debt. Nearly as scanty is the evidence as to St. Mary-le-Bow school, consisting of three entries as to the appointment of its master in the Archbishop's registers (1309, 1353, 1399).

Fitzstephen's account of these three schools shows that they were of the highest grade, and indeed some authors have inferred from his account that they constituted a London University. It is evident that the boys began with the elements of grammar, studied the classics, learnt to make verses, including epigrams;

then proceeded to rhetoric as in the rhetoric schools of Greece and Rome, and to logic, which was destined in the Universities almost to quench the classics altogether. At St. Paul's school, the City School *par excellence,* Thomas Becket as a boy and youth learnt the elements of rhetoric and logic which he perfected as a young man at Paris University (*annis igitur infantiæ* (under 7), *pueritiæ* (7 to 14), *et pubertatis* (14 to 18), *domi paternae et in scholis urbis decursis, Thomas adolescens factus studuit. Parisiis*). Not only are we told what they learnt in school, but what their games were. On Shrove Tuesday, the Carnival, the boys brought their fighting cocks to the school, and the whole morning was given up to watching them fight. In the afternoon they went to Smithfield, then a "suburban" open space, and played football, each school having its own game; and the elders and magnates looking on got as excited as they do nowadays over the games. When it froze they skated, and in summer evenings they walked out to those famous wells, Holywell, Clerkenwell, and St. Clement's Danes.

Unfortunately, we have no such illuminating document as this about St. Paul's or any other London school from the days of Becket to the days of Colet. We know that about 1198 the endowment of the school, which seems to have consisted of nothing but a school and the master's house given to Master Hugh, Becket's master who had succeeded Master Durand, who had been master at least from 1098, four acres of land at Fulham and the tithes of Ealing and Madeley, was largely increased. Bishop Richard FitzNeal found, when he became bishop in 1189, that the mastership enjoyed almost an empty name, with no, or, at least a very moderate, endowment, and so he added some two hundred acres of land and the tithes of Horsel. In 1205 a change took place which reacted unfavorably on the school. The canon-schoolmaster changed his title to that of Chancellor, and in accordance with a decree of a Lateran Council, thenceforth devoted himself to theological teaching and the Chancellor's theological school, taking the endowment for that purpose. (See CHANCELLOR'S SCHOOLS.) The school proper, the grammar school, was relegated to a deputy appointed by him, called no longer simply schoolmaster, but the grammar schoolmaster, who was also a canon and appears to have had no endowment beyond the school and house, except probably a payment of only £2 or £3 a year from the Chancellor. The cathedral statutes codified about 1294 mention only that the " Chancellor appointed a Master of Arts to the grammar school and is bound to keep the school in repair." He must, therefore, have been dependent almost entirely on tuition fees. This accounts for an interesting entry in the register of the almoner of St. Paul's, who had the charge of the choristers who were boarded in a house on the north side of the cathedral and attended the grammar school for their literary, as they did the song school for their musical, training. The almoner writes in 1345 that " If the almoner does not keep a clerk to teach the choristers grammar, the schoolmaster of St. Paul's claims 5*s* a year for teaching them, though he ought to ask nothing, because he keeps the school from them as the treasurer once alleged before the Dean and chapter is to be found in ancient deeds " — an entire mistake on the treasurer's part. The choristers at all events received a good education, as an almoner in 1329 gave them by will his books, including his best " Hugucio and the big and little Priscian, Isidore's *Etymology,* all his grammar books, and in addition his books on Dialectic and Natural History, in order that they might be lent to boys apt for learning (*ad scolastizandum*) when they leave the almonry"; also books upon medicine and civil law. So, too, in 1313 and *c.* 1405 benefactors gave sums of money " to the poore choristers of Paules towards their exhibition in the University."

In the absence of cathedral documents, destroyed partly in the fire of London, but more by the carelessness of the custodians, we learn little about the school. In 1394 we find the three old privileged schools asking the king to prevent the Lord Mayor and aldermen from supporting " certain outsiders, pretending to be masters in grammar but having no sufficient knowledge in that faculty, who taught general (*i.e.* public) grammar schools in the city in deceit and fraud of the children, to the great prejudice of the King's lieges and the jurisdiction of Holy Church." As in the case in the Common Pleas about Gloucester Grammar School in 1410 it was stated as a matter of common knowledge that the schoolmaster of St. Paul's claimed a monopoly of school-keeping in London, they no doubt obtained what they wanted. We find, however, in 1419 a payment ordered by the Treasurer of the Exchequer of £4. 11. 6½ to the master of the grammar school at Cornhill for the board, teaching, and maintenance of a royal ward. By Feb. 1, 1425, John Seward " scolemaister " wrote a book of the muniments of the parish of St. Peter's, Cornhill, a copy of which is in the Gildhall. A need for more schools than the three must have been felt, as in 1441 the Bishop of London, the chief authority over St. Paul's school, sanctioned the appropriation to the Hospital of St. Anthony in Threadneedle Street of the church of St. Benet Fink, which stood next door to the hospital, for the endowment of a free grammar school, free from tuition fees, in the hospital. A little later it was connected with the University by the grant to Oriel College of lands for exhibitions there of boys from the school. In 1446 further competition of unlicensed grammar schoolmasters had taken place, persons not sufficiently instructed, presuming to hold " commune gramer scoles" in great deceit of their scholars as also of the friends that put them to school. So the King directed the Archbishop and Bishop of London to provide a remedy, which they did by directing that there should be five schools only, the three ancient ones, one in St. Dunstan's-in-the-East, and St. Anthony's.

The opponents of monopoly, however, met this by a petition to Parliament next year presented in the names of the four parsons of All Hallows the Great, St. Andrew's at Holborn, St. Peter's, Cornhill and St. Mary Colechurch, the latter being schoolmaster of the Hospital of St. Thomas of Acon (St. Thomas à Becket). "The full wise and discreet Commons" were asked "to consider how London was the common concourse of the land wherein is great multitude of young people not only natives but from many other parts of the land some for lack of schoolmasters in their own country for to be informed of grammar there, some for the great alms of lords, merchants, and others. Therefore, it was expedient that in London were a sufficient number of schools and good informers in grammar, and not for the singular avail of two or three persons grievously to hurt the multitude of young people of all this land. For where there is great number of learners and few teachers and all the learners be compelled to go to the same few teachers and to no other, the masters wax rich in money and the learners poor in learning as experience openly showeth against all virtue and order of wele publik," the Commonwealth. So the four asked that each of them might set up a "scole in the same science of gramer" in his parish, the master to be appointed and removed by the parson and his successors. The petition was granted. "The King wille that it be do as it is desired," but so that it be done by the advice of the Ordinary (the Judge of primary ecclesiastical jurisdiction, *i.e.* the Bishop of London, or the Archbishop of Canterbury). The saving clause was probably fatal. There is no evidence of any of the four schools, except St. Peter's, Cornhill, above mentioned. One of the parsons, that of St. Andrew's, Holborn, died next year; another, the parson of All Hallows, the year after. St. Thomas' Hospital was surrendered to Henry VIII in 1538. It was bought by the Mercers' Company, the richest of the London City Companies, whose hall stood next door, three years afterwards in 1541. The King sold it for £969 subject to the condition that the Company should keep three chaplains to pray for his soul, and a free grammar school with a sufficient master to teach twenty-five children and scholars freely (*i.e.* without tuition fees) forever. The Mercers' Hall now stands on the site and the school is still maintained. But the fact of Henry's making it a condition, *i.e.* imposing a trust to keep the school in 1541 is the only circumstance known from which it can be inferred that any school existed in the hospital before its dissolution. As there is no trace of a school in the extant hospital registers the probabilities against any school having been set up before 1541 are very great. The absence of four schools wholly supported and entirely under the rule of four parish parsons cannot be supposed to have been a great loss to learning. That St. Paul's School continued to flourish appears from its master James Garnon being given the degree of Master in Grammar at Oxford in 1449, and from a *mot* of its "Scholemayster" on the sudden beheading of Hastings by Richard III in 1453 being reported by the chronicler Hollingshead. But it is evident that St. Anthony's was a serious rival and probably a superior rival. In 1472 we find the learned Selling, Prior of Canterbury, getting as headmaster of Canterbury School one who had lately taught grammar at Winchester and St. Anthony's, London, and Winchester was then *facile princeps* of English schools. Stow, who seems to have been himself a boy at St. Anthony's, mentions as of his own remembrance among its scions Sir Thomas More, the author of *Utopia*, Lord Chancellor and persecutor of Protestants, now beatified as a Roman martyr, who would have been there about 1485. The "Master Nicholas" who was master there in 1494–1495 was probably Nicholas Holt, one of the most famous schoolmasters of his day. Nicholas Heath, afterwards Bishop of Worcester, Archbishop of York, and Lord Chancellor under Queen Mary, was there about 1509. John Whitgift, Archbishop of Canterbury and founder of the very flourishing school at Croydon, a contemporary of Stow's, went there about 1537.

Meanwhile John Colet, who is said, though not on any first-hand authority, to have himself been a boy at St. Anthony's, refounded and re-endowed St. Paul's School. (See for more detailed statement COLET, JOHN.) The chief novelty in the new school was the large number of boys to be taught. and the great increase in the salaries of the masters, the high master being given £34. 13. 4 as against the £10 given by Wykeham to the Headmaster of Winchester in 1382 and the £16 provided for the Headmasters of Eton and of St. Anthony's in 1443 and 1446 respectively. Also it was the first school, not in which Greek was taught, but in which the statutes mention it. Among the early pupils of the "newe scole of Poules" were Leland, the first and one of the most famous of English antiquaries, William Paget, who managed to remain in favor and power as secretary of state under Henry VIII, Edward VI, and Queen Mary, and as Lord Paget of Beaudesert was the ancestor of the Marquis of Anglesey. But the school does not seem to have kept up its reputation after Lily's successor and son-in-law Thomas Righteous, or Rightwise as it was commonly spelled, took over the school in 1532. Stow, who went to St. Anthony's about that year, recalls how the disputations of the London scholars, which we saw took place in Becket's day and which were expressly directed by a fourteenth century statute of St. Paul's School to be held "in logic and philosophy at St. Bartholomew's on St. Bartholomew's day and to be determined at Holy Trinity Priory" still continued in his time.

Education suffered no loss at all events in London, as is too often represented, by the dissolution of monasteries. The only school we know of in connection with any monastery, and that not for monks or taught by monks, was in the monastery, now the Almonry Grammar School at Westminster (see WESTMINSTER SCHOOL), and that so far from suffering from the dissolution, was put on a much larger and better basis in consequence of it. After, but not because of, the dissolution we find two joint foundations of schools and almshouses, founded, one by Sir George Monoux, a Lord Mayor, at Walthamstow, another, specially praised by Stow, at Ratcliffe, then on a country road which under the name of Ratcliffe Highway, became a byword as a dangerous slum. The dissolution of the monasteries, however, led indirectly to the foundation of that which became one of the largest and richest schools in London, Christ's Hospital (see under HOSPITAL SCHOOLS) in 1553, and half a century later of Charterhouse (*q.v.*). The school disputations were, according to Stow, renewed in King Edward's day in the cloister of Christ's Hospital, "where the best scholars, still of St. Anthony's School," says the patriotic Stow, "were rewarded by bows and arrows of silver given to them by Sir Martin Bowes, goldsmith." The revival, however, could not have taken place under Edward VI, as Christ's Hospital was only legally founded on June 26, 1552, and was only entered on in November, 1552, and Edward died in January, 1553. It more probably took place under Mary. Anyhow it failed, owing to the quarrels between the boys, those of St. Paul's calling the St. Anthony boys pigs, and St. Anthony's calling the Paulines pigeons, and "proceeding to questions in grammar they usually fell from words to blows with their satchels full of books many times in great heaps. So finally they were restrained with the decay of St. Anthony's School." But in another place Stow attributes this decay to the Hospital being "spoiled" when one Johnson, the schoolmaster, became prebendary of Windsor. But in both, Stow's memory was at fault. Under Edmund Johnson, in the first years of Elizabeth, St. Anthony's was at the height of prosperity. On Sept. 15, 1562, "there set out from Mile End 200 children of St. Anthony's School, all well beseen and so through Aldgate down Cornhill . . . to the Friars Austin" (next door to St. Anthony's) "with streamers and flags and drums beating," very much like the famous *Montem* at Eton (*q.v.*). This too in spite of an edict by the Lord Mayor in 1561 "for the staying of all schoolmasters and teachers of youth within this city from making of any more musters or open shows of their scholars . . . in rich apparel or otherwise, either on horseback or on foot, on pain of imprisonment." Johnson, who was a scholar of Winchester, only became a canon of Windsor in 1560, and died in 1562.

What caused the decay of St. Anthony's School was not its masters, but the setting up on a far larger site and in much better buildings and with larger endowments of Merchant Taylors' School, by the Merchant Taylors' Company, whose hall was on the opposite side of the street to St. Anthony's. (See MERCHANT TAYLORS' SCHOOL.)

Almost at the same time, 1560, the impetus given to Westminster School by the refoundation of the Collegiate Church, and its new statutes given by Queen Elizabeth, in which the school was connected with Christ's Church, Oxford, and Trinity, Cambridge, almost as Winchester and Eton with New College, Oxford, and King's, Cambridge, cut into the aristocratic elements of St. Anthony's and St. Paul's. St. Saviour's Grammar School, Southwark, set up by the parishioners in connection with the old Priory church of St. Mary Overy, also in 1560, which also adapted Colet's St. Paul's school statutes, cut off a suburban source of supply, while a patent was granted for a grammar school at St. Dunstan's in the west in 1562, though it had no endowment. Outer London was now being endowed with a ring of grammar schools: Kingston-on-Thames obtained a new charter for its ancient but perhaps decayed grammar school on March 1, 1561. St. Olave's, Southwark, set up a separate grammar school of a lower kind on July 29, 1561. Highgate Grammar School was founded by Sir Roger Cholmeley, chief Baron of the Exchequer, under a patent of May 6, 1565. Through the master being also incumbent of Highgate Chapel the school had in 1819 fallen into a purely elementary school taught by the sexton. It was revived in 1832 and is now one of the great schools of London with 455 boys, of whom 86 are boarders. Harrow (*q.v.*) was founded in 1571. In 1574 at St. Peter's, Cornhill, the parishioners paid £20 a year to the parson to provide a curate and also to pay for "8 poore chyldren to be taught frely in the grammer Skole called the Lybrary." At Croydon a school and almshouse foundation was founded by Archbishop Whitgift in 1599 and flourished considerably up to 1750 when it, too, fell into practical abeyance. It was revived by the Endowed Schools Commissioners in 1875 and is now divided into a Grammar School with 290 and a Middle School with 310 boys.

The Elizabethan era in London schools was more particularly distinguished by the effort made for elementary education. That there was a great deal of elementary education in the city parishes before the Reformation is undoubted. Chantry priests and parish clerks taught schools like that described by Chaucer in the *Prioress' Tale,* which, though attributed to a city in Asia, is obviously drawn from a London street, in which the "little clergeon" and his "felaw" learned to sing and "could but small gramaire." But the parish records have disappeared. At St. Mary-at-Hill, where pre-Reformation Churchwardens' accounts have been preserved, we find John Northfolke, who received 6*s.* 8*d.* for keeping the "quere" (choir) and the organs all the twelve days in Christmas, had a "skole house" provided for him in the Abbot's Inn, and was given 3*s.* 4*d.* for him "and his company and the children when Master parson gave to them a playing week, to make merry." In 1547 a Welsh schoolmaster was paid £8. 10 a year for teaching the children there. So at St. Mary Woolnoth, another Welshman, named Jones, was paid £6. 10 for teaching the singing children. In 1542 Edmund Bonner, the subsequent persecutor of Protestants, issued injunctions directing every parson and chantry priest in London "to instruct, teach, and bring up in learning, the best ye can, all such children of your parishioners as shall come to you for the same, or at the least teach them to read English, taking moderately of their friends that may be able to pay." But it was not till Elizabeth's reign that any organized efforts were made. We then find in 1568 a schoolmaster in St. Lawrence Jewry being ordered to "avoid his school" and after that payments for a schoolmaster. The school was often in the belfry. Thus at St. Ethelburga's in 1589 "received of Smythe, the schoolmaster, for one year's allowance for keeping school in the belfry 10*s.*" At St. Margaret's New Fish Street, in 1595, "Mr. Philip Manfield, M.A., to have the belfry to teach children in by consent of Parson Alton and the parishioners." In 1604 the parson himself was to keep a school in the belfry and make satisfaction, if there be any hurt by any disorder of his scholars. At St. Peter's, Cornhill, in 1609, the Parish Clerk was allowed to teach in the belfry. At St. Botolph's, Aldgate, in 1596 the schoolmaster, "using also the trade of a chandler," was chosen churchwarden. At St. John Zachery in 1600 "paid out about one Edward Laurence a schoolmaster 7*s.* 2*d.*"

The reign of James I was signalized by a fresh outburst of school founding in London, Charterhouse (*q.v.*) being founded in 1611, followed by Dame Alice Owen's School at Islington in 1613, said to have been founded in thanksgiving for a narrow escape from being shot by an arrow, Camberwell Grammar School in 1615, Stratford-le-Bow in 1617, and Godsgift College at Dulwich, a belated imitation of Winchester and Eton by Edward Alleyn (*q.v.*), a successful actor in 1619. This was the most ambitious of all and might have been then what it eventually became through the growth of London, one of the first schools in London, but the founder married a second and young wife before the endowment was completed and its prosperity was delayed till reorganized in 1865 and 1882. Now it maintains four schools, two for boys and one for girls, the former with 673 boys, of whom 150 are boarders, and is among the first of the university scholarship winning schools in England. Alleyn's School has also 600 boys.

The Civil War almost stopped the growth of endowed schools in London and the neighborhood. But Colfe's School at Lewisham dates from the Protectorate of Oliver Cromwell in 1656. The fire of London finally ended St. Anthony's Hospital School, which was never rebuilt after it. Thenceforth there is little or no addition to the London secondary endowed schools. An era of private schools, some of them extremely prosperous, began with the Civil War, notably that of Farnaby (*q.v.*) and one John Milton, poet, also that of Thomas Singleton, expelled headmaster of Eton, who is said to have had 350 boys in a school in St. Mary Axe parish.

With the eighteenth century came the charity schools (*q.v.*), which were particularly successful, as they were particularly needed in London. In that century nearly all the old schools suffered eclipse, save Westminster (*q.v.*). St. Paul's in 1748 had fallen to thirty-five boys. Not until they were refounded by the Endowed Schools and the Charity Commissioners under the Endowed Schools Act, 1869, did St. Paul's, St. Olave's, Highgate, Croydon, Dulwich, or Camberwell recover the prosperity of the sixteenth century. Now St. Paul's, with its 600 boys in its new and spacious realm at Hammersmith, can regard itself as efficient as when it trained that brilliant controversialist, Thomas à Becket, or gave John Milton his bent to high themes of poetry. A. F. L.

See ARCHES, SCHOOL OF THE; CATHEDRAL SCHOOLS; GRAMMAR SCHOOLS; HOSPITAL SCHOOLS.

Present Position. — The history of education in London during the last century coincides with the development of education in England generally, and will be found treated in the article on ENGLAND, EDUCATION IN. Until 1903 education in the London area was administered by the London School Board. In 1903 a special act was passed extending the provisions of the 1902 Education Act to the London County Council, a body which had been established in 1888 under the Local Government Act. In 1889 the London County Council, like the other county councils, under the Technical Instruction Act of that year, was allowed to share in the local administration of technical education and established technical institutes and schools of art of its own and aided the polytechnics and the other institutions providing technical education which had been established by voluntary agencies or by public subscriptions and which were under semi-public management. Further, the London County Council through the Technical Education Board aided the newly established "teaching university" of London and also the endowed and other secondary schools within the county. The aid given was restricted to subjects coming within the statutory definition of technical education. Thus, the London County Council had to a small extent taken part in educational administration before the acts of 1902–1903 came into force on May 1, 1904, and unified local administration by transferring to the London County Council the powers and duties of the London School Board.

Powers and Duties of London County Council. — The London County Council was established by the Local Government Act of 1888. The administrative county covers an area of 120 square miles. This area includes the city of London, whose ancient privileges retain their historic character and power and whose administrative system has been largely left untouched. The county area also includes the areas of twenty-eight metropolitan boroughs. But the county area does not include a considerable number of local authorities, whose areas, together with that of the London County Council, are popularly known as Greater London. The London County Council is the local education authority throughout the whole of the administrative area of 120 square miles. The city of London and the metropolitan boroughs appoint two thirds of the managers of the elementary schools within their areas, but they have no other duties or powers in respect of education.

The London County Council consists of a chairman, nineteen aldermen, and 118 councillors (three ladies). The councillors are elected triennially by fifty-eight electoral divisions: one division, the city of London, having four members. The Council's powers, duties, and liabilities include finance, main drainage, parks, highways, housing of the working classes, asylums, licenses for music, dancing, and theaters, public health, local pensions, shop hours and shop seats, and a great variety of others, as well as those of the local education authority. The Council by statute has also rights of representation on the Metropolitan Water Board and numerous other authorities of a specific character. The Council delegates many of its powers and duties to committees whose "orders of reference" are partly executive and partly advisory. The magnitude of the Council's operations may be gathered from two facts — it spends annually £10,000,000 sterling and employs 45,000 servants and officers of all kinds. The Education Committee, the only committee of the Council which sits in public, consists of fifty members (thirty-eight councillors and twelve coöpted).

All matters relating to the exercise of the Council's powers under the education acts, except the power of raising a rate or borrowing money, stand referred by statute to the Education Committee of the Council; and the Council, before exercising any such powers, unless in their opinion the matter is urgent, receives and considers the report of that committee with respect to the matter in question. The Council may delegate to the education committee any of its powers under the Education Acts except the power of raising a rate or borrowing money. A large part of the powers and duties of the education committee are distributed among the following subcommittees: accommodation and attendance, books and apparatus, buildings, children's care, elementary education, general purposes, higher education, special schools, and teaching staff subcommittees. It is assisted in the administration of elementary education by 181 statutory bodies of managers for provided (council) schools and 355 for non-provided (voluntary) schools, and in the management of its own secondary schools, training colleges, technical institutes, and schools of art by advisory or local subcommittees. The Council also appoints representatives to serve upon the governing bodies of all schools and institutions to which it makes grants. In the various branches of higher education the Council is associated with several other authorities, such as the University of London, the city companies, the governing bodies of endowed secondary schools, and the governing bodies of polytechnics and technical institutes.

The Council spends annually about six millions sterling on education — about £5,000,000 on elementary and £1,000,000 on higher. As the receipts from government grants amount to about £1,600,000, an education rate of 1*s.* 9¼ *d.* in the pound has to be levied. The local education authority thus bears over 70 per cent of the cost of education, the national exchequer bearing less than 30 per cent.

The administrative staff of the Council for education consists of about 1000 officers, including over 100 inspectors and organizers. There are four divisional inspectors for higher education and twelve district inspectors for elementary education, as well as organizers of domestic economy and needlework, manual training, drawing, singing, trade schools, and children's care work.

The County of London is for administrative purposes (education) divided into twelve areas, to each of which there are attached, with their assistants: one district inspector; one divisional correspondent, who conducts the business of the local bodies of managers and associations of children's care committees; one divisional superintendent, who deals with questions of school attendance, employment of children, and the assessment of charges for meals and medical treatment; one district organizer of care committees.

Elementary Education. — Of the public elementary schools, 550 schools are provided and maintained by the London County Council, and 365 schools provided as to fabric by religious and other organizations, but maintained by the London County Council. The accommodation provided amounts to 711,000 places, and there are 650,000 children in average attendance. The schools are open more than 400 half days per year, and the percentage of attendance on roll averages 89.5 per cent throughout the year. Attendance at school is compulsory between the ages of five and fourteen. The education given in both classes of schools is the same. As a rule, the schools are organized in three departments, for infants, boys, and girls. There are a certain number of mixed departments. Each department has its own headmaster or headmistress.

In addition to the ordinary elementary schools, there are some forty central schools (recently established) giving a superior elementary education for selected children who can remain at school up to the age of fifteen. The pupils are selected from the ordinary schools between the ages of eleven and twelve, and in a limited number of cases in which financial aid is necessary bursaries will be awarded from the age of fourteen to fifteen and one half years. (See INDUSTRIAL EDUCATION.)

Open-air schools have been conducted on a small scale during the spring, summer, and autumn months for pupils likely to benefit from open-air treatment. A number of playground classes have also been established in some of the poorest and most crowded districts of London.

Curriculum. — The elementary school curriculum, like that of elementary schools elsewhere, has been framed with the object of developing the general intelligence, character, and adaptability of the children, and includes, in addition to English, arithmetic, history, and geography such subjects as moral instruction, nature study, physical exercises, organized games, swimming, domestic economy, and needlework for girls, and manual training for boys. Subject to a few general regulations, each head teacher frames her (or his) own curriculum. In the central schools the curriculum has an industrial or commercial bias.

Teaching Staff. — The teaching staff numbers about 20,000 (men and women as three to seven), some 14,000 of whom are trained as well as certificated teachers. To fill the vacancies which occur throughout the year in London County Council schools there is formed annually a list of students specially selected from those who will leave the training colleges at midsummer. The teachers on the list are appointed permanently, and are allocated to particular schools as vacancies arise.

Teachers in non-provided schools are appointed by the managers of the schools, the appointment being subject to the consent of the Council, which may be refused on educational (not religious) grounds. Their salaries are paid by the London County Council. With regard to salaries, security of tenure, etc., they are in the same position as teachers in Council schools.

Promotion to the post of head teacher is made from the ranks of the assistant teachers within the service, and for this purpose a promotion list is formed. Applicants for a place on this list must satisfy certain conditions as to service and qualifications.

The salaries paid are set out below: —

	ACCOMMODATION	MINIMUM	ANNUAL INCREMENT	MAXIMUM
Headmasters .	-200	£150[1]	£7: 10s.	£210
	201-400	200	10. 0	300
	401-	300	10. 0	400
Headmistresses	-200	125[1]	4	160
	201-400	150	8	225
	401-	225	8	300
Assistant Masters .		100	5. 7. 10	200
Assistant Mistresses		90	4	150

[1] Salary as assistant + £10 with minimum of

Books and Apparatus. — Head teachers are supplied annually with lists containing particulars of all the articles which appear suitable for school use. All books and school material are supplied from the Council's stores on requisition by a head teacher which as a rule is made twice a year. School lending libraries are also provided by the Council for the encouragement of home reading.

Social Welfare. — The welfare of the child engages much attention. Care committees have been formed in connection with every elementary school in London, and the members of these committees (some five or six thousand voluntary workers) devote much personal service to the care of the children. Meals are provided from the rates for every necessitous child at an annual expenditure of £80,000. The number of children on the necessitous list averages for the whole year some 40,000. The average number of meals per child per week is 4.8, and the average cost of the meal is 2.18*d.* (food and preparation). (See FOOD AND FEEDING OF SCHOOL CHILDREN.) A large medical staff and service is employed by the Council for the medical inspection of school children, and arrangements have been made with hospitals and with local associations of doctors for the medical treatment of children suffering from ailments of the eyes, ears, nose, throat, and from ringworm. The medical staff also deals with the cleansing of verminous school children. Medical inspection is systematic, and some 225,000 children are inspected annually; the medical treatment scheme is yet incomplete. So far some 25,000 children annually are treated at the expense of the rates. (See MEDICAL INSPECTION.)

The Council also aids various voluntary agencies which provide recreative facilities for children out of school hours and during holidays. Local juvenile advisory committees have been established in various parts of London, with the object of finding suitable employment for children when they leave school and of looking after them and their interests when they obtain it. Efforts are being made to organize on a systematic basis the various voluntary agencies which have hitherto been engaged in finding employment for children on leaving school and to secure coöperation between the school care committees and the juvenile labor exchanges established by the government. Large provision is made in special schools for defective children of all kinds, — the blind, the deaf, the physically and mentally defective, and juvenile offenders.

Secondary Education. — *Organization.* — The County Council maintains twenty secondary schools, with an attendance of 4500 pupils at a gross cost of £80,000 a year. It also makes annual grants amounting to £80,000 to forty-two secondary endowed schools with an attendance of 15,000 pupils. In addition to these two classes of schools there are forty-five public or semipublic secondary schools neither maintained nor aided by the Council which provide for 12,500 pupils, and at least some 9000 pupils are known to be in attendance at schools conducted by individuals for private profit.

The pupils in the majority of the public secondary schools are of two classes, fee-paying and (in practice) scholarship holders, one of the conditions attached to the receipt of grants by secondary schools from the Board of Education being that 25 per cent of the school places must be reserved for free education for elementary school pupils. The fees charged range from £4. 13. 6 to £12 a year in the county secondary schools and from £2. 10. 0 to £31. 10. 0 in the aided and non-aided secondary schools.

The curriculum in the county secondary schools is designed to give a good general education to pupils up to the age of eighteen. The teaching staff consists in the majority of cases of specialists in the subjects taught. The salaries paid in the Council's schools to headmasters vary according to the size of the school from £400 to £800, and to headmistresses £300. to £600 according to the size of the schools. Assistant masters receive £150 to £300 (in some cases £350), and assistant mistresses £120 to £220 (in some cases £250).

Scholarships. — The scholarship system may be divided into three classes, county scholarships for pupils desiring a good general education with, as an objective in many cases, a university or technical college education; technical and trade scholarships for pupils who desire an industrial training in substitution for the old apprenticeship system as a preparation for employment in skilled trades; and scholarships for students intending to become teachers. The maintenance grants accompanying scholarships depend in all cases on the income of the parents or guardians of the scholar.

Junior county scholarships are awarded to children between the ages of eleven and twelve, and are tenable for three and in some cases five years. They cover free education at an approved secondary school and in most cases maintenance grants varying from £6 to £15 a year. Every eligible pupil in the London elementary schools numbering annually some 23,000 pupils, must compete for these scholarships. The number of scholarships awarded annually is about 1700. In principle these scholarships mean that the Council does not provide free secondary education for all who desire it, but only for those who can take full advantage of it. Intermediate county scholarships, 300 in number, are open to candidates between sixteen and seventeen years of age and cover free education at a secondary school or other institution for higher education up to the age of eighteen. The maintenance grants attached to these scholarships vary from £10 to £25 a year. Senior county scholarships are awarded to candidates eighteen years of age and upwards intending to pursue a course of study at an institution of university rank. Fifty are awarded annually, varying in value according to the financial circumstances of the candidates and the course of study they have in view. The technical and trade scholarships awarded by the Council vary considerably in conditions. Some provide free instruction in applied science or art with maintenance grants of £50 for day students; others provide free evening instruction with maintenance grants of £3 for artisans engaged in certain definite callings. In addition to these there are trade scholarships for boys and girls of fourteen years of age who wish to enter such occupations as book production, furniture and cabinetmaking, dressmaking, millinery, etc. Free tuition and maintenance grants varying from £6 to £15 a year are provided.

The scholarships for the preliminary education of teachers consist of bursaries followed by student teacherships, each tenable for one year. Bursaries are awarded at the age of sixteen to pupils who have attended a secondary school for three years, and are tenable for another year at the same school. At the expiration of this period the student is awarded a student teachership tenable for one year, during which period he receives training at an elementary school in the art of teaching prior to entering a training college.

Training of Teachers. — The Council maintains seven training colleges with accommodation for 1660 students. The scheme of work, which covers a period of two years, provides a general education as well as instruction in the theory and practice of teaching.

One of the colleges (the London Day Training College) which is recognized as a school of

London University provides a four years' course with a view to the students, who are specially selected, obtaining a degree of the university in addition to the special professional training.

University Education. — The University of London (*q.v.*) consists of three classes of teaching institutions: (1) three colleges incorporated in the university; (2) twenty-nine institutions, including medical, theological, and law schools designated "Schools of the University," which are under separate governing bodies; (3) thirty other institutions at which certain teachers are recognized as teachers of, and certain courses are approved by the university. The London County Council works in close coöperation with the university and makes annual grants both to the university and to several of the constituent schools of the university, including the Imperial College of Science and Technology. The whole question of university education in London is at present under the consideration of a royal commission.

Technical Education. — The most advanced work in technical education is done in the institutions of university rank, but in addition to this a very large amount of technical, commercial, and general instruction is given in polytechnics, technical institutes, schools of art, and evening schools. The instruction given in these institutions covers a wide range of subjects, and as the students in attendance are drawn to a very large extent from those actually engaged during the daytime in industrial employment, the bulk of the work is done in the evening. Some 200,000 evening students are enrolled year by year.

Trade Schools. — In order to provide some approach to a substitute for the apprenticeship system, which has now practically disappeared, a number of trade schools have been established to provide a training for those boys and girls who are prepared to enter certain skilled occupations. The boys' schools provide in some cases a technical training for groups of trades, *e.g.* woodworking, building trade, engineering, and in others for specific trades, such as silversmithing, tailoring, cooking and bakery. In the case of the girls' schools the preparation is for particular trades, such as dressmaking, millinery, corset making, upholstery, and laundry. The trade schools in London number seventeen, of which the Council maintains eight for boys with an attendance of 600, and four attended by 400 girls. In addition to these there are five trade schools in polytechnics, attended by 250 boys and 450 girls. The course of instruction in these schools is designed to turn out intelligent workers able to use their hands and their brains to the best advantage when they enter the workshops. The trade teaching is in the hands of teachers with first-class trade experience, and trade methods and standards of work are adopted.

Cost of Education. — Some idea of the relative importance and magnitude of the various divisions in the Council's educational work may be gathered from some of the heads of the estimated expenditure for 1911–1912 (Capital and Maintenance), which are set out in round figures: elementary education, £2,740,000; secondary and university education, £390,000; technical and evening school education, £320,000; special school education, £200,000; social welfare of children, £125,000; maintenance of buildings, £740,000; books and apparatus, £140,000; total maintenance expenditure, £5,000,000; total capital expenditure on sites and buildings, £730,000.

System of Administration. — It has already been stated that the Council operates by means of committees partly executive and partly advisory. Where powers are delegated by the Council to the committee, that committee deals with the subject matter in the name of the Council and within the limits of the Council's statutory or other authority; in other cases the committee considers and reports on proposals for the Council's decision. The business of education is distributed among subcommittees, who in a like manner "deal with" or "consider and report on" according to the powers and duties intrusted to them by the education committee. The administration of the various services is conducted by departments. At the head of each department is a chief officer who may be called upon by any committee or its subcommittees to report to it on matters within the scope of his duties or their orders of reference. For example, the education officer conducts the business of the education committee, and is the principal executive officer in respect of education, but the clerk of the Council is the final authority on rules of procedure, and, for purposes of coördination, reports on the general effect of staff proposals (except in the case of teaching staff); the comptroller submits a criticism on the financial effect of the education committee's schemes and proposals, and in respect of education is also the accountant, paymaster, and audit officer; the solicitor reports on legal matters; the medical officer is an advisory and administrative officer in respect of medical inspection, medical treatment, cleansing, and so on, of school children; and the educational adviser, who has no executive or administrative duties, reports generally, presenting criticism or advice on the larger schemes or proposals which have been submitted to the subcommittees. The education officer's department is divided into six large branches, and the staff of these branches, subject to the general supervision and direction of the education officer, carry out the education committee's instructions and act as clerks or secretaries of committees of all kinds (central or local) concerned with education.

The education acts of 1902–1903, which brought into being a vast educational organization, have profoundly affected the quantity and quality of public education in England.

The London County Council has effected great reforms in every part of the educational field, and has developed and supplemented higher secondary and technical education into a fairly complete and coördinated system. One great reform remains. A Royal Commission on University Education in London has been at work since 1909. It is expected that the conclusions of this commission will have a powerful and far-reaching influence over the future of university education; and in the growth and development of an ordered system of institutions of university rank the London County Council as the local education authority is intimately concerned. There is one important difference between the powers and duties of the London County Council as local education authority and that of the board of education of a great American city. In England the State, while intrusting certain powers to and imposing certain duties on the local education authority, intrusts the general administration of its education acts to the Board of Education — a state (not a municipal) department; and the State enables the board, under Parliament and by means of grants in aid, to secure general control and direction of education throughout the whole of England and Wales. The grants in aid and the control are not always commensurate. It will thus be seen that, while an American city bears the whole cost of its educational system, it enjoys greater independence than the corresponding municipal authority in England. R. B.

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LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE. — An institution founded in 1895 and since 1900 a school of the University of London in the faculty of economics and political science (including commerce and industry). It was incorporated in 1901, among other purposes "to organize, promote, and supply courses of education specially adapted to the needs of persons who are, or who intend to be, engaged in any kind of administration, including the service of any government, local authority, railways, and shipping, banking and insurance, international trade, and any of the higher branches of commerce and industry and also the profession of teaching any such subjects." The work is arranged under the following heads: economics and statistics; politics and public administration; history, economic and political, including paleography; law; geography; sociology; commerce and industry; accounting and business methods; banking; transport; librarianship. In connection with the War Office a special course in administrative subjects has been arranged for a number of army officers, to equip them for the administrative staff of the army. The courses in transport are attended largely by students engaged in railway administration. Most of the courses are recognized by the University of London for its degrees. The school is, however, attended largely by special and postgraduate students engaged in research; by persons engaged in banking, insurance, accounting, railway administration, etc., and by administrative officers in the service of the government, central or local. Students working for degrees must satisfy the entrance requirements of the University of London. The school has power to grant certificates in geography, medieval history, including paleography and diplomatic, and in commerce. The school possesses a valuable library of some 60,000 volumes and 70,000 pamphlets bearing on its special work. The school issues its own series of *Studies in Economics and Political Science,* and the *Clare Market Review,* the students' magazine, publishes some results of the research work. The students are drawn from all parts of the world, and about 20 per cent are already graduates of some university. Grants are given to the school by the Treasury, by the London County Council, and several public and private bodies, which also maintain scholarships and prizes at the school. The number of students, men and women, enrolled in 1910 was 1626 under a faculty of 62 members.

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LONDON TEACHERS ASSOCIATION, LONDON, ENGLAND. — A professional association of teachers engaged in schools aided or maintained by the London Education Association. It was organized in 1872 as the Metropolitan Board Teachers Association, and has gradually increased its membership and scope of activity until it has become the largest association of its kind in the British Empire. It aims to secure the recognition of teaching as a profession, and has stood in the front in the struggle for professional freedom on such questions as tests for teachers, salaries, questions of corporal punishment, abolition of extraneous duties, inspection *versus* examination, superannuation schemes, size of classes, and freedom from outside interference. The government is in the hands of a general committee of one hundred members, and sectional interests are supervised by subcommittees, including mistresses, teachers in non-provided schools, teachers in higher education institutions, in central and higher grade schools, in evening schools, handicraft instructors, and domestic science instructresses. At the offices of the association members may receive advice on matters of professional difficulty such as, tenure, compensation, salary, sick pay allowances, unfair report, promotion, superannuation, breakdown allowances. The Association also secures to its members some important material benefits in the way of coöperative teaching, reduced rates of subscriptions, benevolent funds, and guidance and direction for holidays. The Association has also been frequently called upon to act as host to groups of foreign visiting teachers from the United States, Canada, Russia, and elsewhere, and is ready to give any information on education within the London area. The organ of the Association is the *London Teacher and London Schools Review,* which appears monthly. The membership in 1909–1910 numbered over 17,000. The General Secretary is Mr. T. Gautrey, who is an elected member of the London County Council, and has a seat on the London Education Committee.

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LONDON, UNIVERSITY OF. — A body carrying on teaching functions in London and within a radius of thirty miles, and examining functions throughout the British Empire. As a teaching body it has relations of three kinds with the teaching and research institutions connected with it; it is entirely reponsible for the finance and management of the "incorporated" institutions, University College, King's College, and King's College for Women, and certain smaller institutions; it has visitorial powers in regard to the "Schools of the University," thirty in number, at which it "approves" courses by teachers appointed by the schools who may or may not have been individually recognized by the university; and it approves courses also at other "public educational institutions," thirty in number, delivered by certain teachers who have been individually "recognized" by the university. The history of the university as a whole involves the history not only of the central body, but of the sixty teaching institutions whose relations with it are those described above. The oldest university institutions are the medical schools which have grown up within the great hospitals. For many of these it is difficult to fix a precise date of foundation. St. Bartholomew's Hospital, the oldest of the hospitals, was founded in 1123, and in 1662 medical and surgical students attended its wards. The creation of the University of London, as it at present exists, is traceable to a letter from Thomas Campbell, the poet, to Lord Brougham, published in the *Times* of Feb. 9, 1825, pleading for the establishment of a "great London University" to provide education for the class between "mechanics" and the "enormously rich."

The college erected in Gower-Street, as the result of the appeal, was entitled the "University of London," and was opened in 1828 as a proprietary institution. In 1829 a charter was granted to King's College (opened in 1831) of which the educational objects were generally the same as University College, but which was established specifically as a Church of England institution. The efforts of the Gower Street College to obtain a charter of incorporation were unsuccessful, but in 1836 charters were simultaneously granted to a new body under the title "University of London" and to the Gower Street College under the title "University College, London." The foundation of University College and of the University of London for the first time made university education in England free from religious tests and accessible without scholarships to students of moderate means. The university, consisting of a senate nominated by the Crown (including among its first members Brougham, T. Arnold, and Faraday), was directed "to hold forth to all classes and denominations . . . an encouragement for pursuing a regular and liberal course of education," and was empowered to give degrees to students who had studied at University College, King's College, or other colleges to be affiliated later. The senate had no power to inspect affiliated colleges or inquire into their methods of teaching; its sole means of control was through its examinations. A large number of institutions were affiliated, some of them secondary schools, and affiliation soon ceased to have any significance.

By the Charter of 1858 the senate were empowered to dispense with certificates of studentship in the faculties of arts and laws; for medical degrees certificates of attendance and clinical practice at a recognized institution were still required, and under this charter the degrees of the University in arts and laws (and later in all other faculties except medicine) were thrown open, without inquiry into their previous education, to all comers, not only in England, but in the British dominions overseas, where examinations were held in specially organized centers. The university became thus an examining body pure and simple, except in the case of medicine. Its examinations won a high reputation for their standard and their fairness; the examiners were almost invariably men of great distinction; and criticisms of the external system of examinations have nearly always been criticisms of the system rather than of the way in which it was carried out by the senate. The charter of 1858 first gave the graduates a status in the university by the constitution of a body of graduates of prescribed seniority called Convocation, with certain important though limited powers. In 1860 the degrees of Bachelor and Doctor of Science were first established, science subjects having been included previously in the arts curriculum. In 1867 a supplementary charter conferred on the university the right to hold examinations for women, and in the same year the university was granted the right to send a representative to Parliament. The senate and convocation agreed in 1878 to accept from the Crown a supplemental charter making every degree, honor, and prize awarded by the university accessible to students of both sexes on perfectly equal terms; it was the first university in the United Kingdom to admit women to degrees. The example of London led the older universities to offer greater facilities to women, and all the universities founded since 1878 in the United Kingdom have given women equal rights with men.

The complete dissociation of examining from teaching (except in regard to medicine) left the institutions for higher education in London unconnected with the university, and led to great dissatisfaction. In 1884 an association, presided over by Lord Reay, was founded to promote the establishment of a teaching university. A royal commission on the reorganization of the university, which was appointed in 1888, and reported in 1889, suggested that the existing university should ask for a charter to enable it to become a teaching university for London, as well as an examining body, but the report led to no result. A second commission, appointed in 1892, reported in 1894; its recommendations were enforced by Act of Parliament in 1898, and statutes made thereunder came into operation in 1900. The new and complex constitution under which the university became a teaching university, but continued also the external examination system, though marking a great advance, proved inadequate to the needs of London. By two fresh acts of Parliament, first University College was incorporated in the university as from Jan. 1, 1907, and then King's College, as from Jan. 1, 1910. A further proposal to incorporate the Imperial College of Science and Technology, an institution itself of a very complex character, proved contentious, and led the senate to ask government to appoint a royal commission to consider the matter. The commission was appointed in 1909 under the chairmanship of Mr. (now Lord) Haldane, with a reference much wider than the senate had asked, and was authorized to inquire into the whole question of higher education in London. The evidence given before the commission shows divergency of opinion on many important points, and it is impossible to predict the results to which it will lead. The commission have, so far (January, 1912), issued only a single recommendation, dealing with the site of the central buildings of the university, which was first housed in Somerset House, removed in 1870 to Burlington Gardens, and again in 1901 to South Kensington, where it was allotted quarters in a building once occupied entirely by the Imperial Institute. The commissioners appeal for aid from public bodies and private generosity to provide a site and buildings in the center of London. It is anticipated that their final report will not be issued until 1913 or 1914.

The university is governed by a senate, including the Chancellor (Lord Rosebery), the Chairman of Convocation (both elected by convocation), and fifty-four other members, of whom sixteen are elected by university teachers, sixteen by the graduates, and the remainder are appointed by the Crown and various public bodies. The senate alone has executive power, but cannot act in matters relating to the teaching side without report from the Academic Council, of which four fifths consist of representatives of the teachers, nor in regard to specific subjects without reports from boards of studies also consisting mainly of teachers dealing with those subjects. In regard to external examinations, it can only act after report from the Council for External Students, mainly composed of representatives of the graduates, and in regard to university extension (*q.v.*), after report from the special board dealing with this matter. There are eight faculties: theology, arts, laws, music, medicine, science (including veterinary science and agriculture), economics and political science (including commerce and industry), and engineering. The faculties were designed mainly as bodies to elect teaching representatives to the senate; but they are frequently consulted for the purpose of coördinating reports from the boards of studies.

There is a general feeling among university teachers that their powers should be increased in future. The boards of studies, thirty-four in number, include, in addition to teachers of the university, distinguished specialists not connected with the university. The teachers of the university are either appointed and paid by the senate, or " recognized," but some of the teaching work in schools of the university is carried on by teachers appointed by the schools who do not receive the title of teachers of the university. A university professoriate is gradually being built up, but the scheme adopted by the senate has not yet been fully carried into effect, and some of the most distinguished teachers do not at present possess the title of "university professor " or " university reader."

The university, through its university extension board, besides conducting local lectures, undertakes the inspection and examination of secondary schools, and holds holiday courses for foreigners.

The incorporated colleges of the university are as follows: University College (opened 1828), King's College (opened 1831), King's College for Women (1881). The following institutions also form an integral part of the university: the Brown Animal Sanatory Institution (established in 1871), the Physiological Laboratory at South Kensington (established in 1902), the Francis Galton Laboratory for National Eugenics (established in 1904), and the Goldsmiths' College (established in 1891, reconstituted in 1904), which includes a department for the training of teachers and classes of a " polythecnic " character.

The following schools are unincorporated: —

	Established	Faculties
Imperial College of Science and Technology: including	1907	Science and Engineering
Royal College of Science		
Royal School of Mines	1851	
City and Guilds College	1878	
Royal Holloway College (for Women)	1883–6	Science and Arts
Bedford College for Women	1849	Science and Arts, also training department and art school
East London College Reconstituted	1841 1882 and 18 2	Arts, Science and Engineering
London School of Economics and Political Science	1895	Economics
South-Eastern Agricultural College, Wye, Kent	1894	Science (Agriculture)
Westfield College (for women)	1882	Arts
London Day Training College	1902	Arts (Pedagogy)
New College Reconstituted	1696 1880	Theology
Hackney College (Congregational)	1803	Theology
Regents' Park College (Baptist)	1810	Theology
King's College, Theological Department	1847	Theology
Wesleyan College, Richmond	1843	Theology
St. John's Hall, Highbury	1863	Theology
St. Bartholomew's Hospital Medical School	1123	Medicine
St. Thomas's Hospital Medical School	*c.* 1200	Medicine
Westminster Hospital Medical School	1715	Medicine
Guy's Hospital Medical School	1724	Medicine
St. George's Hospital Medical School	1734	Medicine
London Hospital Medical College	1740	Medicine
Middlesex Hospital Medical School	1745	Medicine
Charing Cross Hospital Medical School	1818	Medicine
London School of Medicine for Women	1874	Medicine
University College Hospital Medical School	1828	Medicine
King's College Hospital Medical School	1839	Medicine
St. Mary's Hospital Medical School	1843	Medicine
London School of Tropical Medicine	1898	Medicine
Lister Institute of Preventive Medicine	1901	Medicine
Royal Army Medical College	1902	Medicine

Note: In the case of the medical schools the date given is that of the foundation of the hospital mentioned.

The number of registered internal students in 1910–1911 was 4400, but the actual number attending approved courses is probably about three times as great. In the calendar year ending April, 1912, there were conferred 569 degrees on internal students and 674 degrees on external students. The teachers' diploma, established in 1883, was in the same year conferred on sixty-nine internal and twenty-five external students. P. J. H.

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LONDON, WILLIAM (fl. 1658). — Publisher, bookseller, and author, of Newcastle-upon-Tyne, England. In 1658 he published in London: *A Catalogue of the most vendible Books in England, orderly and Alphabetically digested; under the Heads of Divinity, History, Physics, Chyrurgery, Law, Arithmetick, Geometry, Astrology, Dialling, Measuring, Land and Timber, Gageing, Navigation, Architecture, Horsemanship, Faulconry, Merchandise, Limning, Military Discipline, Heraldry, Fortification and Fireworks, Husbandry, Gardening, Romances, Poems, Plays, etc., with Hebrew, Greek, and Latin Books for Schools and Scholars The like Work never yet performed by any. Varietas delectat. London, Printed in the year 1658.* London intended to add annual supplements of the year's publication, but only two appeared (1657–1658, and 1660). In the history of education too little attention has been paid to the question of the distribution of books, and in this respect London's book is remarkable. The *Catalogue* of 1658 contained 3096 titles, distributed as follows: Divinity, 1632; History, 468; Physics and Chyrurgery, 145; Law, 146; Mathematics, 227; Romances, 57; Plays, 103. (See Growoll, A. *Three Centuries of the English Book Trade Bibliography*, p. 49; New York, 1903.) Between two and three hundred books are included in the schoolbook list (Hebrew, Greek, and Latin), which added to Hoole's (*q.v.*) list arranged according to forms in his *New Discovery*, practically gives a complete schoolbook bibliography for the period 1640–1660. London's *Catalogue* contains an "Introduction to the Use of Books in a short Essay upon the Value and Benefits of Learning and Knowledge," written in an eloquent style which has been compared with that of Sir Thomas Browne, and Richard de Bury (*q.v.*), author of the *Philobiblon* (1473). (See Dibdin, T. F., in his edition of Sir Thomas More's *Utopia*, London, 1808.) F. W.

Reference: —

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LONGFELLOW, HENRY WADSWORTH (1807–1882). — Poet and teacher; graduated from Bowdoin College in 1825, and subsequently studied modern languages and literature at several European universities. He was professor in Bowdoin College from 1829 to 1835, and in Harvard College from 1836 to 1850. Author of a modern language textbook. W. S. M.

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LONGITUDE AND TIME. — A subject formerly occupying considerable attention in elementary arithmetic, and still taught in many schools as part of this subject. It entered into the curriculum through the influence of navigation upon commercial arithmetic. It concerns the finding of the difference in longitude between two places when the difference in time is known, or, conversely, the difference in time when the difference in longitude is known. Its practical use to the average citizen is confined almost entirely to a new phase of the subject, namely, Standard Time (*q.v.*). It is probable that the older treatment will give way to the discussion of this phase of the subject. When taught in the schools, it properly correlates with the work in geography, and, indeed, it may even better be treated as a topic in the latter field. There are no difficulties that stand in the way of an elementary presentation of the subject at any time in the sixth, seventh, or eighth school years. Most American courses of study omit it entirely at present, some require it in the seventh school year, and others in the sixth or eighth. Under any circumstances the points that merit most attention are: (1) the prime meridian, (2) the date line, and (3) standard time. In special schools for navigators it would, naturally, be treated much more extensively, as is the case in Europe, where these schools are more highly developed than in America. D. E. S.

LOOMIS, ELIAS (1811–1889). — Textbook author and college professor; graduated from Yale College in 1830, and was tutor there from 1833 to 1836. He was professor in Western Reserve College (1837–1844), New York University (1844–1848), Princeton College (1848–1849), and Yale College (1860–1889). He was the author of fifteen textbooks on the mathematical and physical sciences. W. S. M.

LORD, ASA D. (1816–1875). — Normal school principal and city superintendent, educated in the district schools of New York and at the Potsdam Academy. He taught for several years in Ohio, and in 1839 he organized the Western Reserve Teachers' Seminary. During the eight years that he was at the head of the seminary, 800 teachers were under his instruction. He was superintendent of the schools of Columbus from 1847 to 1856; superintendent of the Ohio School for the Blind, 1856 to 1868, and superintendent of the New York School for the Blind at Batavia, 1868 to 1875. W. S. M.

LORD, NATHAN (1792–1870). — Sixth president of Dartmouth College; graduated from Bowdoin in 1809 and the Andover Theological Seminary in 1815. He was engaged in teaching and preaching, and was president of Dartmouth College from 1828 to 1862. He wrote several theological works. W. S. M

LORDOSIS. — See Spinal Curvature.

LORINSER, KARL IGNAZ (1796–1853). — A German physician, born in Nimes, Bohemia; studied at the universities of Prague and Berlin.

In 1822 he was appointed a member of the government medical board in Stettin, and in 1824 promoted to a medical inspectorship in Köslin, and later in Oppeln. In 1829–1830 he undertook a journey to eastern and southern Austria for the purpose of investigating the plague which was then raging in those countries. He became noted through an attack on the hygienic conditions of the Prussian schools, which he severely criticized in a pamphlet, *Zum Schutze der Gesundheit in den Schulen* (*For the Protection of Health in the Schools*, Berlin, 1836). This work gave rise to a heated controversy, known as *Der Lorinsersche Schulstreit,* in which many physicians and schoolmen took part, and which was largely instrumental in bringing about reforms affecting the health of the pupils of the higher schools, particularly with regard to physical training and the question of overpressure.

He also published a number of medical works and wrote an autobiography in two volumes, which was edited by his son (Regensburg, 1864). F. M.

Reference: —

Beck, K. *Dr. Karl Ignaz Lorinser, sein Leben und seine Verdienste um das Turnen.* (Oppeln, 1896.)

LOTZE, RUDOLPH HERMANN (1817–1881). — Philosopher, born in Bautzen, Saxony, the son of a physician; he determined in early youth to follow his father's profession. In March, 1838, he received the degree of Doctor of Philosophy from Leipzig University, and in July of the same year that of Doctor of Medicine. In 1839 he became a member of the Faculties of Medicine and of Philosophy at Leipzig, where he remained until called in 1844 to Göttingen to succeed Herbart. In 1881 Lotze accepted a call to Berlin. He had but entered upon his work there when his death occurred in July of that year. His life was uneventful in incident, and his activities were always in some measure restricted by ill-health.

Lotze's literary career may be divided into three periods: (1) Scientific and early philosophical period (1840–1852). The works of this period are chiefly scientific, pertaining to biology, physiology, and medicine. Even in these scientific writings, however, there is obvious a tendency to reach down to the philosophical principles underlying science. To this period belongs the *Medicinische Psychologie oder Physiologie der Seele* (1852), a pioneer work of the new psychology. (2) The period of the *Mikrokosmus, Ideen zur Naturgeschichte und Geschichte der Menschheit* (3 vols. 1856–1864; Eng. tr. by Hamilton and Jones), the aim of which is to reconcile the mechanical and the teleological views of the world. (3) The period of the *System der Philosophie,* in which Lotze purposed to present his philosophical views in comprehensive and systematic completeness. The first two parts only of the projected work were completed, the *Logik* (1874, Eng. tr. ed. by Bosanquet) and the *Metaphysik* (1879, Eng. tr. ed. by Bosanquet). The third part, treating of morality, æsthetics, and religion, was left unfinished at his death. Several little volumes compiled from his lecture notes in part make good this deficiency. The most important of these are *Outlines of Æsthetics*, *Practical Philosophy,* and *Philosophy of Religion* (Eng. tr. by G. T. Ladd). To this period also belongs the *Geschichte der Æsthetik in Deutschland* (1868).

As a philosophical writer Lotze is notable for elegance of literary style, for discretion in metaphysical speculation, for the breadth of knowledge and wealth of culture manifest in all his works. His general philosophical position may be defined as that of teleological idealism. Three chief conceptions underlie his metaphysics, — the conceptions of unity, of teleology, and of personality. The unity of all things in the World-Ground is the central doctrine of his metaphysics. The proof by which this is established is a negative one, resting upon the disproof of the possibility of reciprocal action between things conceived as independent and unrelated. Lotze's discussion of causation, in this connection, is one of the most characteristic and valuable features of his metaphysical theory. His conclusion is that all so-called transeunt action is in reality immanent action, that causal action is possible only because all things are immanent in the World-Ground. Having shown that cosmological speculation leads inevitably to the positing of one Infinite Being as the Ground of all that is, Lotze proceeds to identify this Absolute with the religious conception of God. By three distinct lines of argument Lotze seeks to establish the personality of God: The Infinite must be a Person in order to be the ground of finite personality; the source and ground of the moral order and moral ideals must be sought in a personality; and finally, reality can be predicated only of that which exists as personality. The argument that to ascribe personality to the Absolute is to limit that Being, Lotze meets by a counter assertion, namely, that the Absolute is the only complete personality, of which human personality is but the finite and imperfect copy. The idea of teleology is also implicit in Lotze's fundamental conception, for the Good is an active principle which realizes itself in all reality. To justify his belief in a final purpose which prescribes the course of the world is the chief aim of Lotze's philosophical undertaking. His discussion of the teleological explanation of the world order, as contrasted with the mechanical, is characteristic and luminous. The express aim of the *Microcosmus* is to show " how absolutely universal is the extent and at the same time how completely subordinate the significance of the mission which mechanism has to fulfill in the structure of the world." His insistence upon the universal validity of the mechanical principle rightly understood, the clearness with which he shows forth the inadequacy of a mere external mechanism and the incompleteness of mechanism as a final explanation, and his noble attempt to prove a teleological principle active in the world through the instrumentality of a universal mechanism, are all features which give this discussion great and lasting value.

Lotze's contributions to both psychology and logic have been important. The *Medicinische Psychologie* extends the principle of mechanism to explain the relation of mind and body and lays the foundation of that branch of modern psychology known as psycho-physics. Lotze is notable for his local sign theory, according to which non-spatial sense attributes, varying according to the locality of the sense organ stimulated, afford the original data out of which our space knowledge is built. The fundamental tenet of Lotze's logical theory is his belief that the mind is essentially active, contributory, in all elements of knowledge. For though the mind cannot act until it is acted upon, yet the matter of its responses is its own, it reacts upon every impression in its own characteristic manner. All our knowledge rests ultimately upon certain universal propositions, or axioms, which are in reality the products of certain habits of action native to the human mind. Our hope of mastering the course of events in the real world rests on three things: (1) Some given reality which thought cannot create. (2) The universality of law in the real world, ultimately a matter of faith. (3) Synthetic judgments *a priori* as the basis of our knowledge of particular laws.

Lotze's influence upon education has been general rather than specific, the influence of an idealistic philosophy with a strongly religious and ethical bent, and reflecting at every point the broad culture and lofty ideals of the man whose system of thought it is. We find in his writings many of the ideas and principles that are vital in educational theory at the present day. The emphasis upon activity and development would seem to ally him with the psychological tendency in modern education; his positive contributions to science and his estimate of the importance of scientific knowledge ally him with the scientific tendency; while his sense of the value of the finite personality, the significance of the aspirations and religious faiths of mankind, and the importance of the study of human institutions and human progress, are in accord with the moral and sociological ideals of the foremost educational thought and effort of to-day.

V. F. M.

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LOUIS AGASSIZ SUMMER SCHOOL. — See Summer Schools.

LOUISIANA, STATE OF. — Originally a part of the French territory of Louisiana, obtained by purchase from France in 1803. The present state of Louisiana was first organized as the Territory of Orleans in 1804, and was admitted to the Union in 1812 as the eighteenth state. It is located in the South Central Division, and has a land area of 45,420 square miles. In size it is about the same area as Pennsylvania. For administrative purposes it is divided into fifty-nine parishes, a term corresponding to county elsewhere, and these are in turn divided into police jury wards, the number varying from five to ten, except in the parish of Orleans, which has seventeen wards. In 1910 Louisiana had a population of 1,656,388 and a density of population of 36.5 per square mile.

Educational History. — The first school in the territory was established by a company of Ursuline nuns, who opened a charity hospital school for girls in New Orleans in 1727. A Capuchin school for boys was also opened about the same time. After the Spanish occupation, several Spanish teachers were sent over, in 1772, to attempt to change the language of the people, but their schools were very poorly attended. They are reported as not having had more than thirty pupils at any time, while eight French schools, which were then in existence, enrolled about 400. In 1805 the University of New Orleans was founded, a very ambitious project, on the plan of the University of France. This was to include schools of all grades, an academy and a public library in every parish, and a University in New Orleans. The project received aid until 1826, when it was definitely given up.

In 1806 a free school law was enacted, but was repealed in 1808. In 1811 the sum of $2000 for buildings and an annual grant of $500 was made to each parish for an academy. The first constitution of the state, framed in 1812, contained no mention of education. A few primary schools were established in the different parishes, and in 1819 the police juries of the parishes were directed to supervise and care for such schools. In 1821 the law was changed so that the police juries were directed to appoint five resident landowners as trustees. In the same year an appropriation of $800 was made to each parish for the benefit of an academy in return for the instruction of eight pupils free. A parish tax of $1000 annually was also authorized. Grants of various kinds were made during the next twenty-five years to the parish and parochial schools, and to academies and colleges, in return for the free instruction of a certain number of indigent pupils. This has well been called "the beneficiary period." It began about 1811, and lasted until the final adoption of the free public school principle in 1845. In 1827 it was enacted that the state might give $2.62½ monthly for each student educated in the parish schools up to $1350 per parish, and it was provided that all indigent children must be received in the parish schools. By 1834, 1175 indigent children were being educated in the state.

In 1833 the Secretary of State was made *ex officio* Superintendent of Education. During the next ten years a number of governors and educational committees recommended the entire abolition of the subsidized parochial system, and the substitution of a free public school system in its place. In 1841 New Orleans was permitted by special act to establish a free public school system, to employ a superintendent of schools, and to raise money for schools by local taxation. The example of this city, which in a few years compared favorably in school attendance with the larger cities of the North, exercised a good influence in shaping public opinion for free schools in the state. In 1845 a commission of five was appointed to extend the public school system, and the new state constitution of 1845 put an end to the old system of subsidized private schools, and provided definitely for a system of public education.

The legislature was directed "to establish free public schools throughout the state" and "to provide means for their support by taxation on property, or otherwise"; the office of Superintendent of Public Instruction was created; the common school fund and the seminary fund were defined and declared to be perpetual funds upon which the state was to pay 6 per cent interest; and a University of Louisiana in New Orleans was provided for. The constitution of 1852 practically repeated the provisions of the constitution of 1845, but changed the superintendency of public instruction from appointment to election, and gave the General Assembly power to abolish the office when "no longer necessary." The free school law of 1847 carried the mandates of the constitution into effect; created the office of parish superintendent, abolished two years later; levied a one-mill state tax for schools; clearly defined and definitely provided for the creation of a permanent state school fund by the consolidation of all land grants and donations; and provided for the distribution of the income to the parishes on a census basis (in 1852 the constitution was amended to insure this); declared the schools open to all white children between six and sixteen, and insured every white under twenty-one two years of tuition free; gave the control of the schools in each district to three directors; and authorized district taxes for school buildings. The University of Louisiana was established, and continued to exist until its absorption by Tulane University in 1884. In 1852 a State Institute for the Deaf and Dumb was established. In 1859 a normal school was established by the legislature in New Orleans, and in 1860 the State Seminary of Learning was opened at Alexandria. In 1855 a poll tax of $1 was levied for schools in addition to the above. By 1852 one half of the educable children of the state were reported as in attendance at the public schools. Even yet the schools were not entirely free for the entire term, as one sixth of the revenue in 1850 and one eighth in 1860 still came from tuition fees. Schools continued during the early part of the Civil War period, the legislature of 1862 appropriating $485,000 for free public schools; but the war practically put an end to this early school system.

In 1864 a new constitution was adopted, largely as a war measure, by General Banks, which retained most of the provisions of the preceding constitutions, but omitted the census basis for the distribution of school money; omitted all mention of the seminary fund; provided for a four-year term for the State Superintendent and a salary of $4000 per year; and ordered that all schools should be taught in the English language. The reconstruction constitution of 1868 retained the provisions of the preceding constitution; raised the salary of the State Superintendent to $5000; ordered a public school in every parish; and forbade any distinction as to "race, color, or previous condition," or any appropriation or subsidy to any private school or teacher.

The law of 1869 carried these constitutional provisions into effect. The state was divided into six districts, and for each of these a district superintendent, reporting to the State Superintendent, was provided. To an appointed State Board of Education was given the control of all state institutions and the appointment of all local boards of education. The state tax was increased to two mills, and local district taxes up to five mills were authorized. In 1870 a parish tax of two mills was also authorized. The effect of these new provisions was unduly to centralize and increase the cost of administration, and to turn the schools over almost entirely to the colored race, except in the rural parishes, where separate schools for the whites were maintained in defiance of the law. Little progress was made in general education in the state until 1887, when separate schools for the two races were established. By 1875–1876 the total school enrollment was only 74,846 out of a school population of 274,688. In 1870 the State Seminary of Learning was converted into the University of Louisiana, and moved to Baton Rouge, and in 1872 the Land Grant College was consolidated with it. In 1871 the State Institution for the Blind was established. In

1872 the legislature, to obtain money for salaries and mileage, confiscated the permanent school fund.

In 1879 a new constitution was adopted, which changed the form of administration and materially reduced the expense for this item. The office of State Superintendent of Public Education was continued, but only $3000 was allowed for his salary and the expense of his office; district state superintendents were abolished, and parish boards were permitted to appoint a parish superintendent, but at a salary of not over $200 a year; instruction in the French language and separate schools for the two races were made possible; the legislature was directed to establish a university at New Orleans for negroes and to appropriate not less than $5000 nor more than $10,000 a year for its maintenance; and the debt of the state to the free school fund, confiscated by the legislature of 1872, to the seminary fund, and to the agricultural and mechanical college fund, was determined and declared a perpetual obligation, but the interest on these debts was lowered and was to be paid from the annual appropriations for schools. The new constitution of 1898 contains similar provisions to those of the constitution of 1879, but amplified and made somewhat more definite. A school census was ordered; the debt to the school fund was directed to be paid out of the state's revenues and not out of the annual school appropriations; the restrictions as to the salaries of parish superintendents were removed; and the prohibition of aid to sectarian schools was extended to private schools as well.

In 1881 the Southern University for Colored Students was opened; in 1884 a state normal school was established, and opened the next year at Natchitoches; in 1884 the old University of Louisiana, established in 1847, was absorbed by the new Tulane University, and Tulane University became a semi-public institution; in 1888 the State Board of Education was directed to advertise for bids for a uniform system of schoolbooks for the schools of the state, to be adopted on four-year contracts; in 1896 teachers' examinations were systematized and made uniform throughout the state; in 1894 the Louisiana Industrial Institute, a literary and industrial school of secondary grade for whites, was established at Ruston, and in 1898 the South Western Louisiana Institute, a similar school also for whites, was established at Lafayette. In 1898 a State Biologic Station, for investigation and for the training of teachers in biological sciences, was established at the mouth of Calcasieu Pass, near the Gulf of Mexico. In 1902 special tax districts, with local taxes, were permitted. In 1904 a $600 minimum salary for parish superintendents was fixed by law.

In 1906 credentials were accepted from state institutions for teachers' certificates. In 1908 the state constitution was amended so as to increase the salary of the State Superintendent from $2000 to $5000; parish (county) superintendents were made school treasurers *ex officio;* the limit of local tax was raised from 1¼ to 3 miles; and a child labor law was enacted. In 1910 the parish school boards were given the right to levy taxes, independent of the county authorities; a state textbook commission was created, and the period for adoptions extended from four to six years; monthly teachers institutes and the study of agriculture were required.

Present School System. — At the head of the school system is a State Board of Education and a State Superintendent of Public Education. The State Board of Education is composed of the Governor, the Superintendent of Public Instruction, and the Attorney-General, together with seven citizens appointed by the Governor, one from each congressional district of the state. Appointed members receive the same pay as members of the legislature. Subject only to the legislature, this body is the supreme authority in the state in educational matters. Appeals from the decisions of the State Superintendent may be made to it for final settlement; its suits are given preference in courts of law, and bond and security are not required; it approves all requests for permission to establish high schools in the state; it is empowered to adopt a uniform course of study for the schools of the State; it outlines the courses of study for all teachers' training schools, and provides all rules and regulations for the examination of teachers; the quadrennial school census is sent to it by the parish assessors for approval; it has power to ask for special reports from the parish superintendents, and may make rules and regulations for the government of the schools of the state, not forbidden by law. The Superintendent of Public Education is elected by popular election for four-year terms, and receives a salary of $5000 per annum, with an appropriation for office expenses. He is *ex officio* a member of the State Board of Education, and also acts as its secretary and its executive officer. He is also a member of the Boards of Supervisors of the State Schools, of the Board of Institute Managers, and of the State Board of Examiners. He has the general supervision of the schools of the state; decides disputes sent to him on appeal, subject to final approval of the State Board of Education; may call conventions of school officers for consultation; apportions the school fund to the parishes; and calls meetings and publishes the proceedings of the State Board of Education. In addition to the State Board of Education, there is a State Board of Examiners, consisting of the State Superintendent, the president of the Louisiana State University, and the president of the Louisiana State Normal School, which is empowered to adopt rules and regulations for the examination of teachers for state certificates; and also a Board of State Institute

Managers, consisting of the State Superintendent and the president of the State Normal School, who have control of the summer normal schools of the state and select the institute conductors. A State Textbook Commission adopts uniform texts for the state and is instructed by law to show a preference for Louisiana books.

For each parish (county) there is a parish board of school directors and a parish superintendent of public education. The parish boards are elected by the qualified electors of each police jury ward of the parishes, one from each ward, and for four-year terms. Teachers are not eligible for membership on these boards. Members of parish boards may be removed from office by the Governor, if the State Board of Education approves. Each parish board elects a parish superintendent of public education for a four-year term, who serves as secretary of the board and as its executive officer. Parish superintendents must hold a certificate of eligibility from the State Board of Education, and the revocation of this certificate vacates the office. Parish boards have general supervision of the schools of the parish; elect all teachers for the schools on the nomination of the parish superintendents; appoint two teachers to assist the parish superintendent in examining teachers; are charged with the care and preservation of the school property of the parish; on the recommendation of the parish superintendent, locate and change the location of schools; estimate the amount of school money needed each year; may issue bonds for school purposes; may appoint auxiliary visiting trustees for each ward, or school district, or school in the parish; and must make detailed reports to the State Board of Education as to the conditions of the schools and the work of the school officials.

The parish superintendent is required to devote his entire time to the work of supervision; conducts examinations for teachers' certificates; nominates teachers for election by the parish boards; signs all contracts; may remove teachers for cause; must visit each school at least once each year; must hold monthly teachers' institutes on Saturdays; is treasurer for the parish school funds; makes quarterly reports to the State Superintendent on the condition of the funds; pays out all money on the order of the president and secretary of the parish board; has charge of the sale and preservation of any sixteenth-section lands; and must make quarterly reports to the parish board, and annual reports to the State Superintendent, and reports as called for to the State Board of Education.

The Parish of Orleans, whose boundaries are the same as those of the city of New Orleans, receives larger liberty and special privileges in the matter of school government and school taxation, being governed, in part, by special legislation.

School Support. — Louisiana originally received 786,044 acres of land in the sixteenth-section grants. Much of this was so located as to be of little value, and some of it is still on hand. The annual interest on this fund is apportioned to the townships to which the land originally belonged. The state also received its share of the United States Deposit Fund, distributed in 1837. This was devoted to internal improvements at the time, but the interest on the fund ($28,795.14) is now devoted, according to the provisions of the constitution of 1898, to the support of common schools. The state also received two townships (46,080 acres) of land for a seminary of learning, and 210,000 acres for an agricultural and mechanical college. The funds were largely lost during the war or squandered during the Reconstruction period, and remain to-day as "perpetual obligations," for which the state taxes itself to pay the annual interest due on the several funds.

The constitution requires that not less than one and one fourth mills of the six-mill state tax shall be applied to the support of schools. The State School Fund is apportioned directly to the parishes on the basis of the number of children in each between the ages of six and eighteen, as determined by a quadrennial census. The proceeds of the state inheritance tax are also added to the annual school fund.

The police juries of each parish must levy a parish tax for schools of not less than three nor more than six mills. Councilmen or trustees in cities, towns, or villages, and the people of school districts, may vote (since 1902) special taxes for additional school facilities. In 1907 there were 509 such special tax districts, as against 389 in 1906, 272 in 1905, 199 in 1904, and 153 in 1903. A poll tax of $1, fines, and forfeited bonds, remain in the parishes where collected, and are added to the current school funds. Special school taxes may also be voted for buildings, improvements, or support, by petition, election, and an affirmative vote. The old "fuel tax" is still levied in Louisiana, parish boards still having "authority to assess and collect $1 per annum on each family" sending a child or children to school.

Educational Conditions. — Of the total population nearly one half are negroes, and over 90 per cent are native born. But two states, Mississippi and South Carolina, contained a larger proportion of negroes. In thirty-one of the fifty-nine parishes the negroes outnumber the whites; in seventeen parishes they outnumber the whites two or more to one; in two parishes they outnumber them six to one, in two others, eleven to one, and in one sixteen to one. Of the total population of the state, one fifth live in the city of New Orleans, and of the remaining four fifths, about 73 per cent live in rural districts. There are but two other cities in the state, Baton Rouge and Shreveport, which have 8000 inhabitants. The state is essentially a rural and agricultural state, with one large commercial city.

The percentage of illiteracy is still very high, notwithstanding recent large deductions. A child labor law has been enacted recently, but the state has as yet no compulsory attendance law, or means of enforcing attendance. Only 62 per cent of the schoolhouses are owned by the parishes; but 69 per cent of the schoolhouses are listed as being provided with blackboards; but 70 per cent as having any means of heating the building; but 65 per cent as being provided with patent school desks; but 58 per cent as having charts and maps; and but 22 per cent as having a globe. The average value of all forms of school property, the city of New Orleans included, is about $2000 per school. Little beyond the regular common school branches is taught in any of the elementary schools. Graded schools, containing the upper grammar school grades, are to be found in most of the towns, and may be established, where necessary, by the parish boards. Manual training is provided in very few school systems. Elementary schools may also be taught in the French language, where French is spoken. Uniform textbooks for the schools of the state are adopted by the State Textbook Commission on six-year contracts.

Teachers and Training. — For the training of teachers the state maintains the Louisiana State Normal School, at Natchitoches, and the Parish of Orleans maintains the New Orleans Normal and Training School. The state also provides a State Institute Conductor, who is appointed by the Board of State Institute Managers (Superintendent of Public Education and president of the Normal School), receives a salary of $2500 and traveling expenses, and has charge of the summer normal schools, one-week institutes, and parish teachers' association meetings. To meet the expenses of these, the state appropriates $12,500 annually, the Peabody Fund gives $2000, and all persons taking an examination for a teacher's certificate pay a fee of $1 each. The summer normal schools are graded, and are held at various points in the state. Ten of the summer normal schools were for white teachers and four for colored teachers. The term varies from three to eight weeks. The conductor also holds one-week institutes and directs the work of the Teachers' Association Meetings in the parishes. The latter involved reading circle work, and the outline of work called for seven meetings in each parish during the year. About one third of the teachers attended the one-week institutes, and about two thirds were members of the Parish Teachers' Associations and Reading Circles. Luther College, a Lutheran College in New Orleans, conducts a normal department for colored teachers of both sexes.

Secondary Education. — A high school system for the state is yet to be developed. Most of the secondary schools of the state are in part secondary and in part elementary, and few reach the standard of a regular high school. The two Industrial Institutes maintained by the state are in effect technical secondary schools of a good grade. Excepting in the Parish of Orleans, high schools can only be established with the consent of the State Board of Education, and no school can be opened without its sanction, or established unless a site and buildings are provided free of any expense to the school fund.

Higher and Other Education. — The Louisiana State University and Agricultural and Mechanical College, at Baton Rouge, stands as the nominal head of the state school system of Louisiana. Tulane University, in New Orleans, however, has been recognized by law (1884) and by vote of the people (1888) as the successor, in interest, of the old University of Louisiana, opened in 1834, and receives one student free of tuition from each senatorial and representative district in the state. The state also maintains the Southern University at New Orleans for colored students, appropriating (1909) $10,750 for its support. In addition to the above institutions, eight denominational colleges, three of which are for the colored race, supplement the secondary and higher instruction provided by the state.

Special Institutions. — The state maintains the Louisiana State School for the Blind and the Louisiana State School for the Deaf at Baton Rouge; the Louisiana Industrial Institute at Ruston; the South Western Louisiana Industrial Institute at Lafayette; and the State Biologic Station on the Gulf of Mexico. The two industrial institutes offer good secondary instruction to the whites of both sexes in both the academic and industrial courses. E. P. C.

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Reports of State Superintendent of Public Education. Annual, 1848–1879, Biennial, 1881–date.

LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, BATON ROUGE, LA. — A coeducational institution which had its origin in grants of land made by the United States government "for the use of a seminary of learning." In 1853 the Louisiana State Seminary of Learning and Military Academy was founded near Alexandria, opened in 1860, and was removed to Baton Rouge in 1869. The Agricultural and Mechanical College was established in 1873 at New Orleans to carry out the purposes of the Land Grant Act of 1862. The two institutions were united and located at Baton Rouge in 1877, and are maintained by the state. The institution is located on the grounds of the old military garrison, overlooking the Mississippi River and covering nearly 210 acres in extent. The university is an essential part of the state school system. It embraces a College of Arts and Sciences, a College of Agriculture, a College of Engineering, the Audubon Sugar School, the law school, the teachers' college, and the graduate department. Four experiment stations are maintained in Baton Rouge, in New Orleans, at Crowley, Acadia Parish, and at Calhoun, Ouachita Parish. Students are admitted to the university by examination, certificate, or diploma. The entrance requirements are fourteen units. A three years' course in agriculture is also provided based on common school branches. The Audubon Sugar School aims to prepare men as experts in sugar growing and manufacture, and gives a five-year course of work in both engineering and agriculture, with practical instruction at the Sugar Experiment Station, Audubon Park, New Orleans. The Law School gives the degree of LL.B. after a three years' course. Master's degrees are also conferred. In 1911-1912 the enrollment of students was as follows: academic schools and colleges, 600; school of agriculture, 86; law school, 53; summer school, 595; total, 1334. The faculty consists of sixty-one members.

LOUISVILLE, UNIVERSITY OF, LOUISVILLE, KY. — A coeducational institution, founded by decree of the city council in 1837 and opened with a medical college. A law college was added in 1846, and an academic department and the college of liberal arts in 1907. The entrance requirements are based on the work of a standard high school. Courses are offered leading to the A.B. and B.S. and the corresponding graduate courses leading to the master's degrees. The medical department of the university was reorganized in 1908, and consists of the former medical department, the Kentucky School of Medicine (1850), the Louisville Medical College (1869), the Hospital College of Medicine (1873), and the Medical Department of Kentucky University (1898). The entrance requirements to the medical department are those of the Association of American Medical Colleges. The entrance requirements to the law college are high school graduation.

LOUVAIN, UNIVERSITY OF. — See Belgium, Education in.

LOVELL, JAMES E. (1795-1892). — Apostle of Joseph Lancaster (*q.v.*) and organizer of the first monitorial schools in the United States; born at Colne, Lancashire, England, and educated in a boarding school at St. Ives. He was tutor in the family of the Duke of Bedford and teacher in monitorial schools conducted by Joseph Lancaster in London and Woburn. He was induced by Lancaster to come to the United States, where he established Lancasterian schools at Philadelphia, Amherst, and New Haven. He was principal of the Lancasterian School at New Haven from 1830 to 1853. He was the author of several textbooks. W. S. M.

See Lancaster, Joseph; Monitorial Schools.

LOVETT, WILLIAM (1800-1877). — The English chartist who took a prominent part in the early movement for coöperation and association among workingmen and later joined the Radical movement for reconciling the reformers of the middle classes with the working classes. It was while he was in Warwick Gaol (1840) that he with John Collins wrote *Chartism; a new Organization of the People, embracing a Plan for the Education and Improvement of the Peoples, politically and socially,* much of which is devoted to a plea for better educational facilities. Suspicious of government control, the authors recommend local management of schools with financial assistance from the central authority. The organization of a National Association of the United Kingdom for promoting the political and social improvement of the people was proposed, which in addition to political aims was to establish "public halls as schools for the people," which were to be used as infant, preparatory, and high schools (taking pupils from three to twelve or thirteen years of age), and as social centers for adults. Playgrounds and school gardens were to be annexed. Circulating libraries, public lectures, discussions, readings, and baths were to be organized in connection with the district hall. The orphans of members were to be educated in agricultural and industrial schools. The end of education was to be the physical, mental, moral, and political training of children. Beginning with the rudiments, the curriculum was to be gradually broadened to include geography, physical and natural phenomena, elements of applied chemistry, design, geology, and mineralogy, "the first principles of the most useful trades and occupations," horticulture and gardening. The objective methods were to be used in teaching all the subjects of the school, especially in the lower grades. "The equal and judicious development of all the faculties, and not the mere culture of the intellect," was to be the aim of instruction. The teachers were to be trained in normal schools, and in time only those who were certificated by the association were to be employed; and to attract men of genius the teachers were to be well paid and honored in their communities. Many of the suggestions for the general organization of education show a broad grasp of its social importance, and the details of methods display a knowledge of Pestalozzi and Lancaster, and a genuine desire for improvement. In 1837 in *An Address from the Working Men's Association to the Working Classes on the Subject of National Education*, Lovett advocated an educational system to include infant schools (for children from three to six), preparatory schools (six to nine), high schools (nine to twelve), and colleges or finishing schools (for all above thirteen) to be used also as social centers. State training colleges were to be established, and no unqualified teacher was to be appointed. Local schools were to be under the control of school committees, while at the head of the system there was to be a Committee of Public Instruction, selected by Parliament, to have charge only of the financial administration. About 1849, when he retired from political work, Lovett taught anatomy and physiology, which he had studied himself, first in the district school of the association, and later in several other schools. In 1852 he wrote *Social and Political Morality, an Essay regarding the Extension of Education*, in which he develops the above scheme with greater fullness and again insists on local rather than national administration. He wrote an *Elementary Anatomy and Physiology for Schools* (1851). Lovett's *Autobiography* (entitled *Life and Struggles of William Lovett in his Pursuit of Bread, Knowledge, and Freedom*, 1876) forms a valuable source of information on the movement, in which he is recognized to have been one of the ablest leaders.

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LOWE, ROBERT, VISCOUNT SHERBROOKE (1811–1892). — British statesman, born at Bingham, and educated at Winchester and Oxford (University College). He graduated in 1833, was fellow of Magdalen College, and for some time private tutor, and was called to the bar in 1842. From 1843 to 1850 he lived in Sydney, Australia, and took a prominent part in the politics of New South Wales. In 1844 he carried a resolution for a select committee to inquire into educational conditions, and in 1846 a resolution in favor of the establishment of a board of education. (See AUSTRALIA, EDUCATION IN.) On his return to England he entered Parliament on the Liberal side, and there attained a prominent position, on several occasions serving in the ministry. In 1868 he was elected the first member of the University of London. He retired from active politics in 1880. Lowe is an important figure in the history of English education, for it was as Vice-President of the Committee of Council on Education (1859–1864) that he introduced the famous Revised Code (1861) which established the system of payment by results. Lowe had a strong belief in the superiority of examinations over inspection, denied that a science of education was possible, and aimed at an economical and mechanical system of education rather than a thoroughgoing reform. The system of payment by results continued until 1890, and it is due to Lowe that the evil pedagogical traditions from which English elementary education is just emerging were introduced, although from the administrative standpoint something was gained in establishing standards and laying the foundations of a national system. But how sincere Lowe was in his endeavors to promote public education, and how much faith he had in the Revised Code, may be seen in his address on *Primary and Classical Education*, delivered before the Philosophical Institution of Edinburgh (1867), in which the influence of Spencer is very strongly marked, more particularly in his attack on classical studies. The address carries the more conviction since Lowe was himself regarded as a good classical scholar.

See ENGLAND, EDUCATION IN; EXAMINATIONS; PAYMENT BY RESULTS.

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LOWELL, JAMES RUSSELL (1819–1891). — Poet, critic, and teacher; graduated from Harvard College in 1838 and the Harvard Law School in 1840. He was professor in Harvard University from 1855 to 1880 and Lord-Rector of the University of St. Andrews, Scotland, 1884–1885. He was editor of the *Atlantic Monthly* (1857–1862) and the *North American Review* (1863–1872). W. S. M.

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SCUDDER, H. E. *Biography of James Russell Lowell.* (Boston, 1901.)

LOWELL, JOHN (1799–1836). — Founder of the Lowell Institute (*q.v.*); studied in the schools of Edinburgh, Scotland, and Boston and at Harvard College; engaged in mercantile pursuits and traveled extensively. At his death he left one half of his estate ($250,000) for the organization of free lecture courses in Boston in philosophy, natural history, arts, and science. W. S. M.

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BARNARD, H. *American Journal of Education*, Vol. V, pp. 427–440.

SMITH, HARRIET K. *History of the Lowell Institute.* (Boston, 1898.)

LOWELL INSTITUTE, BOSTON, MASS. — An organization founded upon the bequest of John Lowell, Jr., for " the maintenance and support of public lectures, to be delivered in Boston, upon philosophy, natural history, the arts and sciences, or any of them, as the trustees shall, from time to time, deem expedient for the promotion of the moral, and intellectual, and physical instruction and education of the citizens of Boston." The amount of the bequest was $250,000, and as a provision was made that 10 per cent of the income was to be added annually to the principal, the Institute has always had a great amount of wealth at its disposal. By the terms of the bequest one trustee is to be responsible for the general management, and he is to be a member of the Lowell family, so far as possible. The first trustee was John Amory Lowell who was assisted by Dr. Jeffries Wyman as curator with charge of the details of the work. The opening lecture was delivered by Edward Everett on December 31, 1839. The Institute has always been able to command the services of the most eminent scholars in their field, not only in this but in other countries. Among the lecturers the following may be mentioned: in science, Silliman, Agassiz, Tyndall, Wallace, Geikie, G. H. Darwin; on religious subjects, Lyman Abbott, Mark Hopkins, Henry Drummond; in literature, philosophy, art, history, and education, Edward Everett, J. R. Lowell, Child, Norton, Barnard, Channing, Hale, Holmes, Lanciani, Fiske, Bryce, Eliot, Mahaffy, Ferrero. Agassiz, in fact, remained in this country as a result of his successful course at the Institute which led to the foundation of the Lawrence Scientific School. In addition to the general courses, special classes have been held in drawing from 1850 to 1879; and in science for school teachers in connection with the Boston Society for Natural History. Courses have also been given for workingmen under the auspices of the Wells Memorial Workingmen's Institute. In 1872 the Lowell School of Practical Design was instituted for the promotion of industrial art. Free tuition is given in drawing and weaving in a course of three years. The courses are at present (1912) arranged in the following series: I. Free Public Lectures in Huntington Hall; II. Free Evening School for Industrial Foremen (applied science); III. Teachers' School of Science (in connection with the Boston Society of Natural History); IV. Collegiate Courses; V. Free Lectures in King's Chapel on Current Topics in Theology; VI. Free Lectures on Local Natural History. Series III and IV are part of the University Extension Courses given by a combination of all the colleges in and about Boston. The present trustee is President A. Lawrence Lowell, and the curator is William T. Sedgwick.

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LOWELL LECTURE COURSE. — See Lecture Systems.

LOYOLA. — See Jesus, Society of, Educational Work of.

LOYOLA COLLEGE, BALTIMORE, MD. — See Jesus, Society of, Educational Work of.

LOYOLA UNIVERSITY, CHICAGO, ILL. — See Jesus, Society of, Educational Work of.

LÜBECK, FREE TOWN OF, EDUCATION IN. — See Germany, Education in.

LÜBEN, AUGUST (1804–1874). — German schoolman; was born in Golzow, near Küstrin, Pomerania, and educated at the Seminary of Neuzelle. In 1822 he was called as assistant teacher to the seminary of Weissenfels, where he was greatly influenced in his pedagogic development by Barnisch (*q.v.*). In 1825 he took charge of a village school in the province of Saxony, in connection with which he managed a very successful training class for teachers; in 1829 he became the principal of a larger school in Aschersleben; and in 1849 he was appointed to a still more important position in Merseburg. In 1858 he was called as director of the newly established Teachers' Seminary in Bremen, where he remained until his death. He published a large number of pedagogic writings, and deserves especial credit for his improvement in the teaching of nature study and of the mother tongue. His reader for *Bürgerschulen*, published in 1851 in collaboration with Nacke, was very widely used. From 1857 until the time of his death, he edited the *Pädagogischer Jahresbericht* (*Educational Annual*), as well as from 1861 on, the pedagogic magazine *Der praktische Schulmann* (*The Practical Schoolman*). Among his works may be mentioned also his *Anweisung zu einem methodischen Unterricht in der Pflanzenkunde* (*Methods of Teaching Botany*, Halle, 1832), followed by a similar work for zoölogy and anthropology (1836), and his *Einführung in die deutsche Literatur* (*Introduction into German Literature*), the tenth volume of which was published in three volumes in Leipzig, 1892–1896.

F. M.

LUBINUS, EILHARD, or EILERT LÜBEN (1565–1621). — A German scholar and educationist, son of a pastor in the duchy of Oldenburg, who studied at Leipzig and other universities, and in 1595 became Professor of Poetry in the University of Rostock. In 1605 he transferred to the Chair of Theology in the same university, and died in 1621. (See *Allegemeine Deutsche Biog.*, Band XIX, p. 331.) Lubinus published many works, including editions of the *Epistolæ* of Apollonius, the *De Vanitate Mundi* of Bernard, the Greek Anthology, the *Epistolæ* of Hippocrates, the works of Horace and Juvenal, the *Dionysiaca* of Nonnus, Persius, the *Epistolæ* of Phalaris. He wrote a *Clavis Græcæ Linguæ cum Sententiis Græcis Latine explicatis*, an edition of which was published by the London Stationers' Company in 1620. The *Medulla Linguæ Græcæ* was published in London as late as 1745.

As an educationist, however, Lubinus is now chiefly remembered for his remarkable epistolary Discourse, prefixed to his edition of the New Testament (1614). This was printed in English by Samuel Hartlib in his small collection of tracts on *The True and Readie Way to learne the Latine Tongue*, 1654. (See HARTLIB, SAMUEL.) It was in this Discourse, that realistic education of the seventeenth century received its earliest, clearest statement; and, as Mr. Quick suggested, Comenius probably took from it the idea of an illustrated *Orbis pictus*. (Quick, R. H., *Educational Reformers*, p. 166.) Lubinus says that living creatures ought to be painted and shown to children; and only those known to children should at first be given the Latin names. (See also KINNER, CYPRIAN.) All terms or words, he further says, of things which can be seen and painted can be taken from the *Nomenclator* of Hadrianus Junius (*q.v.*), provided those are first chosen which are already known by the child. Lubinus is thus the father of systematic pictorial illustration as an educational method. F. W.

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LAURIE, S. S. *John Amos Comenius.* (Cambridge, 1887.)

LUCA DE BORGO SAN SEPOLCRO. — See PACIUOLO.

LUCIAN OF ANTIOCH. — Presbyter and martyr, holds a place in the history of pedagogy, not as formulating pedagogical principles, but as giving the characteristic tendency of what is known as the School of Antioch. The first known teacher of that school was Malchion, who seems to have combined general education with specifically theological instruction, and who confuted Paul of Samosata, Bishop of Antioch, and brought about his deposition. Whether Lucian shared the opinions of Paul at the time cannot be determined. A creed written by Lucian, or attributed to him, shows little resemblance to the teachings of Paul. It is highly probable that he left the communion of the Church about the time Paul was deposed, and remained out of communion under the next successors of that prelate, or from about 275 A.D. to 303. But in spite of his highly equivocal ecclesiastical position, he became head of the local theological school. His great contribution to the work of that institution was insistence upon what are now recognized as the fundamental principles of scientific exegesis, or the literal and grammatical interpretation as opposed to the allegorical method at that time generally in vogue in the Church. This spirit of scientific exegesis makes the work of the Antiochian exegetes of permanent worth. In speculative theology Lucian's efforts were by no means so fortunate. Arius, Eusebius of Nicomedia, and several other early leaders of Arianism were trained by Lucian. Of the works of this great teacher only fragments remain. His edition of the *Septuagint* was long widely used in the churches of Constantinople, Asia Minor, and Antioch. It does not exist to-day as a whole, and its reconstruction is a task yet unperformed. Of his exegetical work only fragments remain, but his principles are abundantly illustrated in the still valuable commentaries of Chrysostom and Theodore of Mopsuestia. Lucian died as a martyr in Nicomedia, Jan. 7, 312.

The material for the life of Lucian is singularly scanty. About all that is known has been gathered by A. Harnack in his article in the *Realencyclopaedie für protestantische Theologie*. Accounts may be found in the various histories of the Christian Church. His literary remains are to be found in Routh, *Reliquiæ sacræ*, Vol. IV. J. C. A., Jr.

LUDER, PETER (*c.* 1415–*c.* 1474). — German humanist, chiefly worthy of note as the first humanist lecturer in any German university. He had himself studied at the University of Heidelberg. He had spent much time in Italy as a student at Ferrara under Guarino, had made a voyage to Greece, and had studied medicine at Padua. In 1456 he was appointed Professor of Poetry and Rhetoric at Heidelberg, and delivered an inaugural address in praise of the humanistic studies, defending them against charges of immoral tendencies. He met with opposition both of the students and the clergy. He next appeared at Erfurt in 1460, and in 1462 at Leipzig. After a short time at Basel (1464), he is lost sight of in the retinue of Duke Sigismund of Austria.

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PAULSEN, FR. *Geschichte des gelehrten Unterrichts.* (Leipzig, 1896.)

LUDIMAGISTER (*Ludi-Magister*, master of a school). — The term used in Rome for the teacher of an elementary school (*ludus*), also called *literator*. Only the rudiments of reading, writing, and calculation were taught here. The term appears again in the English schools of the sixteenth century, when *ludimagister* is synonymous with *archididasculus* and Headmaster. In Germany the term *ludirector* is found at the same period.

See ROMAN EDUCATION.

LUNCHES AND LUNCHROOMS IN SCHOOLS. — (See also FOOD AND FEEDING OF SCHOOL CHILDREN for the dietetic aspect of the subject.) The need of school lunches is now so generally recognized that few large high schools are without them, and the elementary schools are beginning to take up the problem in earnest. When the distance between home and school makes the noon luncheon at home impossible for the child, there is scarcely a justifiable argument against its provision at school. Too little care is given to lunch carried by the children even from the better homes, its daily preparation being universally conceded to be the most irksome of all household duties, and the carrying of it so disagreeable to the child that no lunch at all is preferable. If money is given to buy lunch with unguided choice, it is spent at alluring push-carts for unwholesome, even poisonous, hot meat sandwiches and for ice-cream cones and pickles. It is wise and often necessary to make outside purchase impossible, as has been done in many schools.

High Schools. — The problem of providing high school lunches has been met in most schools in the following way: the Board of Education provides the rooms and permanent equipment, — chairs, tables, ranges, hot water, gas, etc., — and either awards the concession to some individual or club, thus receiving a suitable per cent on the investment, as Chicago does in her nineteen high schools, or appoints at a salary a woman who takes charge of it as of any other department of the school, and works out intelligently the problem of providing at minimum cost the best of food in hygienic and appetizing variety. This method is followed in St. Louis and Indianapolis. With the first method the profit goes to an individual or club, and carries with it the temptation to sacrifice quality for gain. With the second, the profit that accrues is used for improved equipment and facilities, or allowed to grow as a school fund for whatever use the Board may specify, or is taken periodically as the basis for reduction in prices charged. A combination of the first and last ways has been used in the Manual Training High School of Indianapolis, until in two years the tableware was greatly improved, with an astonishing effect upon the manners of the children at table; and the price of luncheon was reduced almost half. The medium of exchange in use there is an aluminum check of three-cent value. This buys any of six or eight kinds of sandwiches, generous in size and of excellent quality, salad, sauce, or fresh fruit, a large bowl of soup with fresh toast, any hot vegetable, coffee, cocoa, milk, pie, or ice-cream. Two of these checks buy hot roast, dressing and gravy, finer salads with wafers, or an ample bowl of shredded wheat and cream. In St. Louis a five-cent check buys a combination, such as sandwich and milk, salad and wafers, individual baked beans with bread and butter, etc. Nine or ten cents at these places buys a much better luncheon than most children ever bring from home. In the Englewood (Ill.) high school, which is excellently conducted by a woman's club, the average cost of luncheon to the child is twelve cents. In these schools every article of food is of superior quality, and the cooking and cleanliness are above reproach. The general plan for getting the work done is to employ competent women at good wages in the kitchen, and let students assist in serving, with pay according to time given. Each person eating gets his own dishes and food, paying for the latter as he takes it, and after eating carries his dishes and any paper or refuse to receptacles for these, and the bare tables are washed for the second sitting. Nowhere is the buying of food compulsory. Children may bring all or part of their luncheon and use tables and dishes without charge; but in order to make it successful it is well to have some restriction upon outside buying by avoiding the open noon hour and making the lunchroom attractive and the quality of food irresistible. The frequent requests for pickles, bakers' pastries, etc., soon die out, and the absence of headaches and afternoon languor is acknowledged.

Elementary Schools. — The problem of school lunches is only beginning to be solved in elementary schools, where the longer recess and shorter distance tend to make it less serious. During the present year (1911) the Board of Education of Chicago has begun an experiment to provide suitable noonday luncheons for children whose mothers are away from home during the day. The plan is being tried in three centers. For one cent the child is provided with (1) a sandwich of bread and jam or bread and syrup, and a glass of milk, or (2) a bowl of bean or pea soup with bread. A woman is employed to prepare and serve this, and whatever cost exceeds the sum brought by the children is borne by the Board of Education. One school in the poorer districts of Indianapolis has successfully furnished a bowl of soup and toast at one cent. A woman living near does the cooking, friends give dishes, and the children do the serving under direction of teachers. It makes a social hour, and improvement is noticeable in the manners, the physical appearance of the children, and in their ability to do the afternoon work. E. K. C.

LUND, UNIVERSITY OF. — See SWEDEN, EDUCATION IN.

LUPSET, THOMAS (*c.* 1498–1530). — Scholar and protégé of Dean Colet (*q.v.*), who placed him in St. Paul's School and later maintained him at Pembroke Hall, Cambridge. In 1515 Lupset went to Italy and on his return graduated B.A. at Paris. Settling at Oxford in 1521, he lectured on Cardinal Wolsey's foundation on the humanities and Greek. From 1526 onwards he held several rectories. Lupset belonged to the circle which included Colet, More, Erasmus, and Linacre. He prepared and corrected work for the press of

Erasmus, Linacre (*Galen*), and More (*Utopia*, 2d ed.). In a letter to Colet (1512) Erasmus says of him, "Thomas Lupset, your true pupil, is both useful and agreeable to me by his daily companionship, and the assistance he lends me in these corrections."

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LUTHER COLLEGE, DECORAH, IA. — Opened in 1861 near La Crosse, Wis., and moved to its present location in 1862. It is under the control of the Norwegian Lutheran Synod. A four-year preparatory department is maintained in addition to the college. Candidates are admitted on completion of a four-year preparatory course. The degree of A.B. is conferred. The faculty consists of sixteen members.

LUTHER, MARTIN (1483–1546). — The great German Protestant reformer and advocate of the development of an organization of schools and the reformation of school subjects and school work. He was born at Eisleben, and brought up at Mansfield in Saxony. In 1497 he went to school at Magdeburg, and then to Eisenach. He went to the University of Erfurt in 1501. In 1505 he entered the Augustinian Monastery at Erfurt. In 1508 Luther was called to become a professor in the newly established University of Wittenberg, where his duties were to lecture on the *Dialectics* and *Physics* of Aristotle. In 1509 he became a Bachelor of Theology, and thus was entitled to lecture on the text of the Holy Scriptures; and in the same year he was invited to Erfurt to lecture to higher students in theology. In 1511 Luther went to Rome on a mission connected with Erfurt, and the experiences derived from this journey were highly educative. In 1512 he became sub-prior of the monastery at Wittenberg, and in the same year he took the degree of Doctor of Theology in the University of Wittenberg, and became professor of theology — then devoting his whole mind to scriptural studies — first to the Psalms, then to the Epistle to the Romans, learning Greek for that purpose. He read much of Augustine, and of the recent writers, especially Tauler. In 1517 he issued his Ninety-Five Theses with regard to Indulgences. These were placed on the door of the Castle Church at Wittenberg, this act being regarded as the starting-point of the Reformation. In 1520 a Bull was issued against Luther, and in 1521, at the Diet of Worms, he was called upon to recant. He refused to do anything against conscience. Called upon, accordingly, to help to build anew the Church, Luther set upon the work of translating the whole of the Scriptures into German. The New Testament was published in 1522; the canonical books of the Old Testament were finished in 1532, and the Apocrypha in 1534, in which year the translation of the whole Bible into the vernacular first appeared.

Revolutions in Church doctrine and government have usually been accompanied by changes in educational systems. Luther saw the necessity of a reformation of schools, as soon as he became conscious of the need for a reformation of the Church, since the religious instruction of the child in the family and in the school was the very basis for the continuity of the new faith. After his translation of the New Testament, he prepared his *Larger* and *Smaller Catechisms*, which were issued in 1529. (See CATECHISM.) He was made miserable by the fact that "the common people know nothing at all of Christian doctrines, and many pastors are well-nigh unskilled and incapable of teaching." In his preface to the *Larger Catechism* he insists that it is the duty of the father of each household at least once a week to question his children and servants in this Catechism. Luther thus is the pioneer of Protestant household instruction in religious subjects. Luther's Hymns, in the collection known as *Geistliches Gesangbuch* (1525), containing thirty-two hymns, of which twenty-four were by Luther, was composed for the use of schoolboys as choristers. His hymn beginning *Ein feste Burg ist unser Gott* is a Christian classic for both children and adults. Luther is of profound significance in his insistence on the educational and religious possibilities of family life, and the idea of the good housewife and good men of the house, and good house government with Protestant religious training has sunk into the German consciousness as one of the great traditions of Lutheran influence.

Luther's principal works bearing directly on schools and education are the *Letter to the Mayors and Aldermen of all the Cities in Behalf of Christian Schools* (1524), and the *Sermon on the Duty of Sending Children to School* (1530). He advocates the necessity of schools for religion and for supplying preachers, jurists, scribes, physicians, schoolmasters, as well as rulers. But he would have all children, boys and girls, go to school for an hour or two a day, and still leave them time to learn to do business work and housework as well. So necessary is schooling that Luther advocated compulsion. "For if magistrates may compel their sturdy subjects to handle musket and pike in war, how much more should they compel subjects to keep their children at school. For there is a worse war to be waged with the devil, who is busied secretly thus to impoverish towns and principality through the absence of education." Therefore magistrates should be warned to keep all suitable boys at school. "To give money for this purpose is, rightly speaking, to give money to churches. This is not releasing souls from purgatory; it is preventing souls from going anywhere but to heaven." But Luther does not only base his arguments for the need of schools on religious grounds, for he says, "Were there neither soul, nor heaven, nor hell, it would be still necessary to have schools for the sake of affairs here below," and again, "The highest welfare, safety and power of a city consists in able, learned, wise, upright, cultivated citizens, who can secure, preserve and utilize every treasure and advantage." Education, accordingly, was conceived by him as an essential preparation for the ordinary duties of life in the home, vocation, civic life, and the church. It is not surprising, then, to find how highly Luther appreciates the services of the teacher. In one of his sermons he says: "A diligent devoted school-teacher, who faith fully trains and teaches boys can never receive an adequate reward, and no money is sufficient to pay the debt you owe him." He says elsewhere, "If I were not a preacher, there is no other calling on earth I would have rather than that of schoolmaster. We must not consider how the world esteems it and rewards it, but how God looks upon it." Luther recognizes the disciplinary value of teaching on the schoolmaster himself, and says he would wish to see all preachers go through the experience of schoolmastering before taking up that office. "When one has taught about ten years, then he can give up teaching with a good conscience."

Luther advocates the learning of the classical languages. God has not caused the Scriptures to be written in Hebrew and Greek in vain. Where these languages flourish, the power of the prince of darkness will be destroyed, and the glosses of scholastics become useless. Languages are best learned by practice. We learn the vernacular from oral speech at home, in the market, and in the pulpit better than through books. Grammatical knowledge is important, but the knowledge of subject matter is essential, and particularly in the teacher. Mathematics should be taught at the university stage. Luther combated astrology, pointing out that Esau and Jacob were born under the same constellation, and yet were so dissimilar in disposition. History is an important study, teaching us through examples and illustrations. What philosophy, founded on reason, discloses as helpful to noble living, history shows forth in living example. Out of stories and histories, nearly all laws, arts, and examples of wisdom, comfort, fear, strength, courage, instruction arise. Luther urges the study of dialectic, as showing order and reason, and the grounds of forming judgments. Rhetoric should be studied, so that we may be effective in putting points to others. Dialectic, he says, is proper to the reason; rhetoric as an influence on the will. Music is a beautiful, noble gift of God, near in its educative position to theology. "Unless a schoolmaster sings," says Luther, "I think little of him." It has been claimed for Luther that he supported nature study. For he argued that "*now* we look forward to attain the knowledge again of the created world, which was lost by Adam's Fall. Now we regard more rightly the creatures of God than we did in the old religion." As to physical exercises, Luther says: "These two exercises and pastimes please me best of all, viz. music and the tournament with fencing, wrestling, etc. The former drives away anxiety from the heart and gloomy thoughts. The latter renders the limbs of the body elegant, fit, and well-proportioned, and keeps it in health and elasticity, etc."

Luther thus touches on many points of educational theory and practice. All his education is subordinate to the religious *motif*, yet it includes the greatest questions, religious teaching, family education, the vernacular. As the translator of the Scriptures into German, the writer of the German Catechism, the writer of German hymns, and, in pursuance of these aims, the teacher and trainer of his own children, Luther stands out as the Prophet of German popular education, and the inspirer of princes and magistrates in the erection of popular schools. His sympathetic attraction to teaching is shown by his words: "Let no man think himself so intelligent that he can despise children's play. When Christ wished to teach man, He had to become a man. If we are to train children, then we must become children with them." F. W.

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LUTHERAN CHURCH AND EDUCATION IN THE UNITED STATES. — Certain ecclesiastical bodies, because of their attitude toward public education and their belief in parochial systems of schools, deserve special notice.

Among the Protestant denominations, the Lutheran is the most conspicuous of these.

Historical Development. — When the Germans began to settle in America in larger numbers during the eighteenth century, they at once provided for the schooling of their children. Every German sect had its parochial schools. Wherever a community erected a house of worship, it immediately also established a school. The ministers were frequently the school teachers. Some schools had professional teachers, who had come over from Europe, and some of these were men of a superior education, who soon became the leading spirits of their colonies, as John Ulmer in Maine, who led the German soldiers in the siege of Louisburg. The Palatine schoolmaster, John Thomas Schley, who was the mainstay of school, church, and community in Frederick, Md., Holzklo in Virginia, Arndt in North Carolina, and above all Franz Daniel Pastorius, the scholar and leader of Germantown, were other eminent pioneer teachers. The Swedish Lutheran congregation at Christiania in 1699 had a school and a teacher. In the instructions given in 1749 to M. Acrelius, as "Propst" of the Swedish Lutheran Church in America, he was enjoined : As soon after his arrival in America as he might familiarize himself with conditions there, he should endeavor to institute a school for children in each congregation.

The activities of the Lutheran and of other German religious bodies is summarized in the historical sections of the article on Pennsylvania. (See also GERMAN INFLUENCE ON AMERICAN EDUCATION.) The Lutheran was the most important of these German sects. Their activity has been continuous. H. M. Muehlenberg and Schlatter, Kunze, Helmuth, and Schmidt, who had once been students of Francke at Halle, did much to improve the cause of parochial schools. At the first meeting of the Ministerium of Pennsylvania (1748), Brunnholtz made a full report on "The Condition of the Schools." In 1750 flourishing schools are reported in all the congregations except one. In 1796 the steps taken by the Assembly toward the introduction of "free schools" aroused the fears of the Ministerium that its parochial schools might suffer injury thereby, and a committee was appointed to address a petition to the Assembly on the subject. In 1804, 26 congregations report 89 schools; in 1813, 164 schools are reported by 52 pastors; in 1820, 206 parochial schools in 84 congregations. The American public school system in course of time gradually absorbed the parochial schools of the older German churches in the East. Still, up to the third quarter of the century, many excellent parochial schools are found in the Ministerium of Pennsylvania and New York. The mother congregation, St. Michael's and Zion's, in Philadelphia, was particularly active in this field. In 1744 John F. Vigera, an excellent teacher, is mentioned as its schoolmaster. In 1761 the schoolhouse on Cherry Street was opened. In 1800 the congregation had four schools, with 250 children. In 1870 the congregation had about 1000 children in its parochial schools in different parts of the city. Among the schoolmasters were Schmauk, Haas, Lang, Schnabel. In the New York Ministerium the number of parochial schools is considerably larger in proportion than in Pennsylvania. The serious difficulty with which the parochial school system had to contend in these two oldest synods is the lack of a teachers' seminary. In 1871 a society was organized in New York for the founding of such an institution, but the plan finally failed from lack of proper support.

Development of Present System. — The Lutheran parochial school system reached its greatest development in America in the North Central states within the congregations affiliated with the Lutheran synods of Missouri, Wisconsin, Ohio, and Iowa. A twofold purpose actuated the members of this church in founding and maintaining parochial schools: first, the desire to bring up their children in the faith of their church, and second, the wish to maintain and transmit their mother tongue and German culture. Schools were therefore organized, if possible, in every congregation or parish, and it was considered a function incumbent on the pastor to lead in the establishment of schools within his parish, and not only to superintend, but also, circumstances not allowing the appointment of a professional teacher, to impart instruction himself.

The individual congregation owns its parochial school and controls it through a school board elected by the congregation, of which the pastor as a rule is an *ex officio* member. The teachers are usually called by the congregations without a time limit and with a fixed salary. They also serve as organists and musical directors of the congregation. The financial expenses of the school are covered by fixed and graded tuition out of the congregation treasury or by voluntary contribution. The school year comprises from thirty-five to forty-eight weeks, with holidays and summer vacations. In schools where several teachers are employed, the curriculum follows as far as possible that of the public schools, the aim being to equal the course of the seventh grade in the public schools. Male teachers are employed almost exclusively. In some schools the primary department is in charge of a lady teacher. Some congregations maintain a parochial school during the summer months or only on Saturdays, instruction being given as a rule only in religion and German, the children attending the public schools during the remainder of the school year. Courses of study for the different grades have been published, comprising instruction in religion, English, German, arithmetic, history, geography, singing, drawing. The teachers of each synodical district hold regular monthly or quarterly conferences or institutes, and also a yearly general teachers' meeting.

Since 1866 the Missouri synod publishes the *Lutherische Schulblatt*, a monthly, edited by the faculty of the Addison Teachers' Seminary and published at St. Louis, Mo. In 1876 the Wisconsin synod began to publish the *Lutherische Schulzeitung*, edited by Dr. F. W. A. Notz, Watertown, Wis., till 1894, and by the faculty of the Martin Luther College, New Ulm, Minn., till 1905.

In order to supply well educated and trained teachers who should be in close touch with the interests of the Lutheran Church, Lutheran normal schools were established. Pioneer work along this line was done by the Missouri synod. As the number of parochial schools and interest in good schools grew, several Lutheran synods established and maintained normal schools, either independent of or in connection with other educational institutions. These " teachers' seminaries " combine certain features of the German type of *Lehrerseminar* with the educational system obtaining in our American normal schools. The full course in the preparatory and in the seminary departments embraces five or six years.

In 1890 the parochial school question became a leading political issue in Wisconsin and in Illinois. The legislature of Wisconsin at the session in 1889 enacted the so-called " Bennett Law " (so named from the member who introduced the bill), ch. 519 of the Laws of Wisconsin, which had been passed without the knowledge of those most interested against it. The chief provisions were: Compulsory attendance of the child for a period not less than twelve nor more than twenty-four weeks in each year, to be fixed annually, in advance of Sept. 1, by the school board in each district or city; that such attendance should be consecutive during such portion of the compulsory period as the board should determine; while excuse for non-attendance was required to be made out to the satisfaction of that board as the sole and final judge; and concluded these provisions with the following section: " No school shall be regarded as a school under this act, unless there shall be taught therein as part of the elementary education of children, reading, writing, arithmetic, and United States history in the English language." Here the statute confessedly denounced as no school within its purview any private school which did not conform to these requirements. This legislation asserted as fundamental doctrine, first, the right of a public authority to prescribe the course and subjects of instruction in schools maintained as purely private establishments, without public cost, by parents who seek to educate their children after the dictates of conscience, and, secondly, the right of the State to intervene between any parent and child, and, *in loco parentum*, to assume and control the education of all children. A bitter political controversy arose. The Lutherans, who had 380 parochial schools with 20,000 pupils in Wisconsin, and the Roman Catholics, with equally large interests involved, vigorously protested against this law as interfering with parental relation, personal liberty, and matters of conscience. In the election of 1892 the party that had passed the law was overwhelmingly defeated and the law was repealed. A compulsory attendance law was then brought forth, which has since given general satisfaction. (*Lutherische Schulzeitung*, Vol. XII ff., and *The Forum*, Vol. XII, No. 2; W. F. Vilas, *The Bennett Law in Wisconsin.*)

At the World's Fair at St. Louis 460 male and 37 female teachers of the Missouri synod made an exhibit of the work of their parochial school pupils in English language, United States history, geography, arithmetic, religion, German language, physiology, zoölogy, botany, general history, penmanship in English and German, drawing. The exhibit was awarded a gold medal. The members of the jury for elementary school work stated that the written work in this synodical exhibit was unsurpassed. As worthy of special merit the German language work was mentioned, and the manner in which the two parallel languages, English and German, were successfully taught and the difficulties overcome. The growth and development of the parochial schools within the Missouri synod was as follows: —

YEAR	SCHOOLS	PASTORS	INSTRUCTORS	
			Teachers	Pupils
1848	14	9	5	508
1858	113	62	51	4,974
1868	367	171	196	22,687
1872	475	224	251	25,300

Lutheran pastors who went to Ohio in 1805 and in the following years began at once to organize parochial schools. In 1815 there were twenty-one parish schools in that state; in 1817, forty-eight; in 1819, fifty-seven.

Present Status. — In the year 1910 the parochial school work of the Evangelical Lutheran Church in America comprised: 4862 parish schools, 3492 teachers, 244,198 pupils, which were distributed among the following synods: synodical conference: 2655 parish schools, 1386 teachers, 132,927 pupils; general council: 594 parish schools, 748 teachers, 26,588 pupils; general synod: 36 parish schools, 3 teachers, 1100 pupils; independent synods: 1577 parish schools, 1355 teachers, 85,583 pupils.

There are several normal schools maintained by Lutheran synods in the United States. In 1854 the Missouri synod founded a teachers' seminary in Milwaukee, Wis., which was transferred to Addison, Ill., in 1864. During the past twenty years, 719 teachers have been educated there. Following are the Lutheran normal schools in America: Teachers' Seminary, Addison, Ill., 11 instructors, 175 students, 6 classes; Teachers' Seminary, Seward, Neb., 8 instructors, 117 students; Martin Luther College, New Ulm, Minn., 8 professors, 118 students; Lutheran Normal School, Sioux Falls, S.D., 8 instructors, 147 students; Lutheran Normal School, Madison, Minn., 182 students, 6 teachers; Teachers' Seminary, Woodville, Ohio, 71 students, 5 teachers; Wartburg Teachers' Seminary, Waverly, Ia., 84 students, 5 teachers.

Higher Education. — No other church, in proportion to its membership and resources, has established so many colleges and seminaries in the United States as the Lutheran Church. The Lutheran educational institutions number 126, having property valued at $9,667,800, endowments amounting to $3,104,200, with 505,110 volumes in their libraries, employing 1049 professors, having 16,731 students.

Theological Seminaries, 26, with property valued at $2,196,300; endowments amounting to $1,100,100, having 163,420 volumes in their libraries, employing 92 professors, and having 1144 students.

Academies, 53; value of property, $1,907,000; amounts of endowment, $96,500 ; volumes in libraries, 59,610; professors, 382; students, 6730.

Ladies' Colleges and Seminaries, 8; value of property, $760,000; amount of endowment, $1000; volumes in libraries, 4850; professors, 104; students, 927.

Colleges, 39, with property valued at $4,804,500; amount of endowments, $1,906,000; volumes in libraries, 277,230; employing 471 professors and having 4950 students in college departments and 2980 students in other departments. The majority of the colleges are open to both sexes. But there are a few institutions devoted exclusively to the higher education of women. The two oldest Lutheran Colleges in America are Pennsylvania College, Gettysburg, Pa., founded in 1832, and Concordia College, Ft. Wayne, Ind., founded in 1839.

W. N.

LUTHERAN COLLEGES, 1910-1911

(Colleges marked with an asterisk give courses based on twelve to fifteen units of entrance requirements and leading to degrees)

* Augustana	(co)	1860	Rock Island, Ill.	Rev. G. A. Andrews, Ph.D.	25	557
* Gustavus Adolphus	(co)	1862	St. Peter, Minn.	Rev. J. P. Uhler, Ph.D.	20	373
* Muhlenberg		1867	Allentown, Pa.	Rev. J. A. Haas, D.D.	15	132
* Thiel	(co)	1870	Greenville, Pa.	Rev. C. Theodore Benze	11	112
* Bethany	(co)	1881	Lindsborg, Kan.	Rev. E. F. Pihlblad, D.D.	46	886
Wagner Memorial		1883	Rochester, N.Y.	Rev. H. D. Kraeling	5	42
Luther	(co)	1883	Wahoo, Neb.	Rev. O. J. Johnson, B.D.	15	290
* Upsala	(co)	1893	Kenilworth, N.J.	Prof. A. R. Wallin, A.M.	14	163
Weidner Institute	(co)	1900	Mulberry, Ind.	Rev. A. H. Arbaugh, A.B.	7	30
Augsburg		1869	Minneapolis, Minn.	Vacant	8	151
Augustana	(co)	1860	Canton, S.D.	Rev. Anthony G. Tuve	11	250
Capital University		1850	Columbus, O.	Rev. J. H. Schuh, Ph.D.	11	118
* Carthage	(co)	1870	Carthage, Ill.	Rev. H. D. Hoover, Ph.D.	15	163
California Concordia		1906	East Oakland, Cal.	Prof. Th. Brohm	2	18
Concordia		1839	Fort Wayne, Ind.	Rev. M. Luecke	11	230
Concordia		1881	Milwaukee, Wis.	Rev. M. J. F. Albrecht	8	194
Concordia	(co)	1881	Conover, N.C.	Rev. Geo. A. Romoser	4	52
Concordia		1881	Bronxville, N.Y.	Rev. H. Feth	7	101
Concordia	(co)	1891	Moorehead, Minn.	Rev. H. O. Shurson	25	470
Concordia		1893	St. Paul, Minn.	Rev. Theo. Buenger	9	156
Concordia	(co)	1904	New Orleans, La.	Rev. Chas. Niermann	4	28
Concordia		1905	Portland, Ore.	Prof. F. W. J. Sylvester	2	15
Dana		1886	Blair, Neb.	Rev. C. X. Hansen	5	158
Immanuel Lutheran		1903	Greensboro, N.C.	Rev. F. Berg	7	200
Lenoir	(co)	1891	Hickory, N.C.	Rev. R. L. Fritz, A.M.	15	225
Luther	(co)	1903	New Orleans, La.	Prof. R. A. Wilde	2	27
Lutheran		1861	Decorah, Ia.	Rev. C. K. Preus	13	200
Luther Proseminary			St. Paul, Minn.	Rev. H. Ernst, D.D.	5	70
Midland	(co)	1887	Atchison, Kan.	Rev. M. F. Troxell, D.D.	12	172
Newberry		1856	Newberry, S.C.	Rev. J. H. Harms	15	242
Northwestern Univ.	(co)	1864	Watertown, Wis.	Prof. A. F. Ernst	12	275
* Park Region Luther	(co)	1892	Fergus Falls, Minn.	Rev. D. G. Ristad	13	200
* Pennsylvania	(co)	1832	Gettysburg, Pa.	Prof. W. A. Granville, Ph.D.	19	304
Red Wing Seminary		1879	Red Wing, Minn.	Rev. Edw. W. Schmidt	9	152
* Roanoke		1852	Salem, Va.	Rev. J. A. Moorehead, D.D.	14	206
St. John's Luth.	(co)	1893	Winfield, Kan.	Rev. A. W. Meyer	9	93
* St. Olaf	(co)	1874	Northfield, Minn.	Rev. John N. Kildahl	30	496
St. Paul's		1884	Concordia, Mo.	Rev. J. H. C. Kappel	8	142
Suomi	(co)	1896	Hancock, Mich.	Rev. J. K. Nikander	10	100
* Susquehanna Univ	(co)	1858	Selinsgrove, Pa.	Rev. Chas. R. Aikens, D.D.	22	258
Wartburg		1868	Clinton, Iowa	Rev. J. Fritschel	7	84
* Wittenberg	(co)	1845	Springfield, O.	Rev. Chas. G. Heckert, D.D.	16	703

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Special Report of the Census Bureau on Religious Bodies, 1906 (Washington, Government printing office 1910), pp. 354, 358, 360, 363, 367, 370, 372, 381, 386, 391, 395.

LUXEMBURG, EDUCATION IN. — The Grand Duchy of Luxemburg comprises an area of about 1000 square miles on the east side of the Rhine, and a population of 246,500 (1905). The religion of the state is Roman Catholic; but liberty of conscience is respected, and the few dissentients, about 2269 Protestants, 1200 Jews, and 240 members of other sects, are protected in all rights and privileges. In the eleventh century a county or earldom within the German Empire, Luxemburg was constituted a grand duchy in 1354, and during the five centuries following, the sovereignty over the state was determined by the course of empire in central and western Europe. In the latter part of the fifteenth century Luxemburg was a possession of the House of Austria; after the death of Charles V the country was ceded to Spain; it came again under Austrian dominion at the beginning of the eighteenth century, and during the wars of the Revolution was annexed to France. The congress of Vienna assigned the grand duchy to the King of the Netherlands, a relation broken up by the revolt of 1830, but restored in 1839; finally by the treaty of London, 1867, the grand duchy was declared neutral territory, and at the death of the King of the Netherlands in 1890, by reason of the Salic law its control passed to Adolph, Duke of Nassau.

The educational history of the country prior to 1839 is identified with that of the states with which it has been successively united.

By the constitution of the grand duchy (bearing date Oct. 17, 1868), public education is placed under the general supervision of the government, and is regulated by legislative acts and by official decrees emanating from the Grand Duke. Primary education forms a department in the Ministry of the Interior under the charge of a Director-General, who is assisted by a Council of Public Instruction and a permanent committee formed from the members of the council.

The system of primary education is based upon the law of July 26, 1843. Subsequent modifying laws are: the laws of July 20, 1869, July 6, 1876, Jan. 2, 1879, providing better conditions for teachers; the law of Apr. 23, 1878, pertaining to the establishment of higher primary schools, and laws of Apr. 20, 1881, and of July 6, 1898, applicable to the entire system.

Every commune (city or rural) is required to establish one or more schools according to the population, and provide the suitable sites and buildings. From the first the State has borne part of the current expenses of the schools, and by ducal order of May 23, 1907, the minimum amount of this aid is placed at 40 per cent of the salary assured to a teacher by the commune. The law of 1881 made primary instruction obligatory for all children from the ages of six to twelve years. Under certain conditions exemption may be claimed for a child at ten years of age, and communes may also extend the compulsory period to thirteen years of age. The primary schools are not free, the local expense for their maintenance being borne by the communal treasury and tuition fees in fixed proportion; the fees are, however, remitted in case of need and the amount met by increase in the communal appropriation.

The course of study for primary schools prescribed by law includes: religion and morals, German language and French language, arithmetic, with the system of weights and measures, elements of geography and of natural history, singing, and for girls, needlework. This program may be extended to include elementary sciences, physical and natural, linear drawing, bookkeeping, and gymnastics.

The law of 1843 required that the religious instruction in the schools should be given by the clergy of the respective denominations, but subsequent laws provide that the subject may be taught by the regular teachers with the consent of the local authorities and under the direction of the clergy.

The Director-General of primary education is appointed by the Grand Duke, as are all the chief officials of the service. The advisory council consists of the bishop, three appointed members, the inspectors of primary schools, and the director of the normal school. The government inspectors for this service are a principal inspector and one inspector for each of the six divisions (*arrondissements*) of the duchy. The salary of the principal inspectors ranges from 5360 to 5650 frs. ($1072 to $1130), that of the subordinate inspectors from 3526 to 3825 frs. ($705 to $765). The local supervision of schools is intrusted to committees consisting in each case of the *bourgemestre* (mayor), the curé, and one or more members of the civil council (elective) according to the population.

Teachers are appointed by the communal authorities, acting in concert with the inspector and with the approval of the Director-General. Candidates for appointment must have a teacher's certificate (*brevet de capacité*) from the Council of Public Instruction, and testimonials of character from the local authorities. The certificate of the lowest order entitles the holder to temporary appointment; permanent appointment can only be obtained after five years' experience and special examination. The teaching force is classified in four grades with salaries for lay teachers ranging by regular increments from 1200 to 2100 frs. ($240 to $420) for men; from 1000 to 1500 frs. ($200 to $300) for women. Lay teachers may also have the right to a residence or a money equivalent, at least 250 frs. annually. After five years' service male teachers receive an additional sum of 100 frs. from the State, which rises by periodical increases to a maximum of 800 frs. after thirty years' service. The salaries of women teachers are supplemented in the same way by increments ranging from 75 frs. to 600 frs.

Communes are authorized to establish higher primary schools to which pupils may be admitted at twelve years of age for a course of two or three years' duration. The teachers of the higher primary schools must be graduates of a secondary school, *i.e.* gymnasium or the higher industrial and commercial school. Communes may also maintain infant schools (school gardens) for children under school age and continuation schools (held in the evening or on Sunday) for adults.

The department of primary education includes the state normal school, which was established in 1817. It is organized in two separate sections, one for young men, the other for young women; the former are day students only. The government offers thirty scholarships for young men and fifteen for young women, which cover the expense in this institution. The number of primary schools is adequate for the needs of the population, and practically all children in the grand duchy receive elementary instruction. The latest statistics pertaining to this department are as follows: —

STATISTICS OF PUBLIC PRIMARY SCHOOLS, 1908

SCHOOLS	NUMBER OF SCHOOLS	PUPILS			TEACHERS			
		Total	Male	Female	Total	Male	Female	
							Lay	Nun
Higher primary schools	22	827	498	329	—	14	8	
Ordinary primary schools	862	33,885	17,338	16,547	865	459	222	184
Infant schools	32	1,661	——	——	32	—	11	21
Schools for adults	800[1]	10,709	4,998	5,711				

According to the latest official statistics (1908), the annual expenditure for primary education amounted to 1,771,824 francs ($354,364.80). Of this total 1,548,318 francs ($309,663.60), or 87½ per cent, was for the ordinary primary schools.

In addition to the schools above considered, the State maintains an institute for deaf-mutes, an institute for the blind at Berbourg, and one for the feeble-minded at Betzdorf.

Higher Education. — The institutions for higher education in Luxemburg date from a law of July 23, 1848; but have been modified by subsequent laws. The most important of these institutions is the Atheneum of Luxemburg, comprising a gymnasium (classical school) and a school of commerce and industry. The latter, which was originally a section of the gymnasium, was separately organized by a law of Mar. 28, 1892. There are also gymnasia at Diekirch and Echternach, which were formerly of inferior grade (progymnasia), but received complete organization by law of 1900, which provided also for the addition of industrial sections.

The gymnasia are classical schools following German models; a law of 1908 provided for dual courses of instruction after the second year, allowing choice between the classical course and a modern course comprising living languages and science. Pupils are admitted to the lowest class of the gymnasia proper or to the industrial sections at twelve years of age. The course of instruction occupies six years.

For technical education there is a school of commerce and industry at Esch-sur-l'Alzette, dating from a law of June 16, 1901, and a school for artisans authorized by a law of Mar. 14, 1896; also a school of agriculture with an experiment station at Ettelbruck, created by law of Feb. 28, 1883.

The charge for tuition in the gymnasia ranges from forty francs to sixty francs per annum. In the school for artisans fees are limited to forty francs a year, and are often remitted.

The state appropriations for these higher institutions are administered by the director-general of finances, and their internal affairs by special committees, appointed, as are the directors and professors, by the Grand Duke.

The Luxemburg Atheneum in 1908 registered 493 students in the gymnasium and 406 in the industrial school; the gymnasium of Diekirch the same year had 159 students in the classical, and 50 in the modern section.

The course of instruction in the gymnasium prepares for the examination leading to the diploma for professors of secondary education, and also for matriculation in the universities of neighboring countries, Luxemburg having no university. In 1910–1911 there were fifty-nine students from the grand duchy registered in French universities, and sixty-one in those of Germany. The fine arts are fostered by the reigning family, and the Conservatory of Music at Luxemburg is celebrated. A. T. S.

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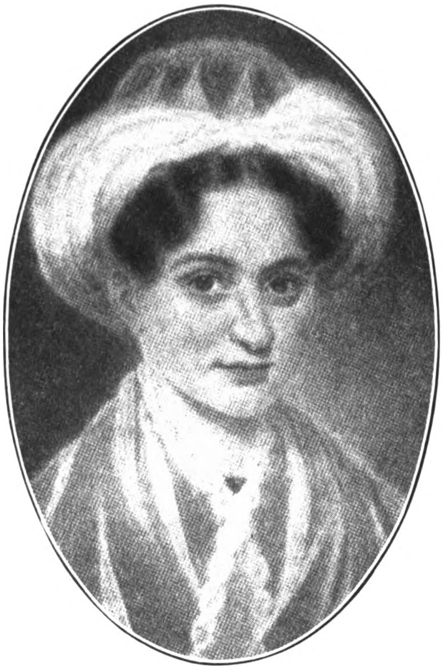
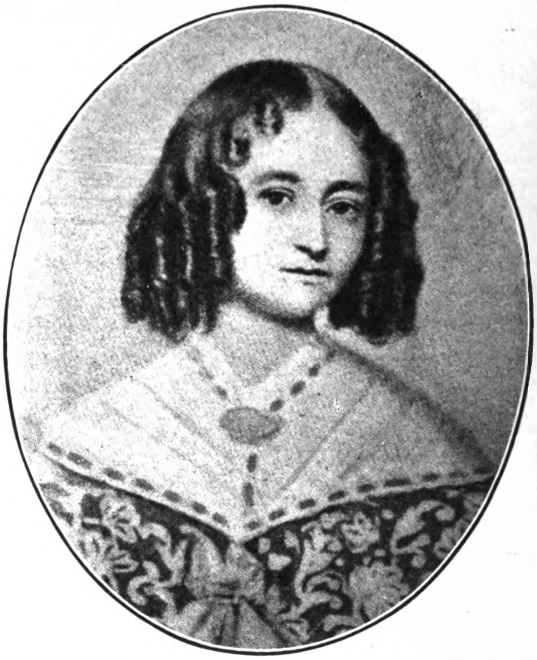
[1] Of this total 440 were for men, 360 for women. They are evening and Sabbath day classes, lasting about five months in the year; in the case of the classes for women the courses pertain very generally to the domestic arts; in those for men, drawing is almost always a pronounced feature.

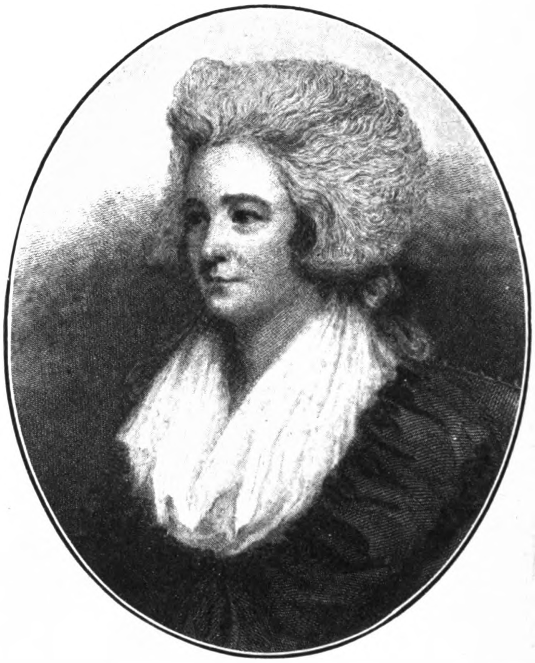


Mary Lyon (1797–1849).
See page 101.



Bertha von Marenholtz-Bülow (1810–1893).
See page 139.

Alice Freeman Palmer (1855–1902).
See page 596.



Hannah More (1745–1833).
See page 317.

A Group of Women Educational Leaders.

Rapport général sur la Situation de l'Instruction primaire dans le Grand Duché de Luxembourg pendant l'Année scolaire, 1907–1908, 1908–1909.

LYCEE. — See FRANCE, EDUCATION IN; LYCEUM; GYMNASIUM.

LYCEUM MOVEMENT IN THE UNITED STATES. — Josiah Holbrook (*q.v.*), who started the lyceum movement at Millbury, Mass., in 1826, stated its purposes as follows: (1) The improvement of the common schools; (2) the formation of lecture courses and the establishment of classes for the education of adults; and (3) the organization of libraries and museums. The first purpose became the chief feature of the American Lyceum Association (*q.v.*). The chief outcome of the lyceum movement *per se* was the organization of lecture courses in many cities and towns and the establishment of libraries. By 1831 there were 900 towns in the United States with local lyceum organizations. Between 1825 and 1850 most of the public lectures in the country were under such local organizations; and this feature of the lyceum movement continued prominent down to 1880. Wendell Phillips, one of the early lyceum lecturers, is said to have given his lecture on "The Lost Arts" two thousand times before lyceum audiences. Lowell Institute (*q.v.*) in Boston and the Brooklyn Institute (*q.v.*), both of which grew out of the lyceum movement, are still in existence.

Many town libraries were also formed by local lyceum associations. The Mercantile Library Association of Boston, composed of merchants and clerks in a local lyceum association, as well as the libraries of the mechanics institutes in many American cities, and the societies for the diffusion of useful knowledge interested in lecture courses and the establishment of libraries and museums, were organized and directed by the men connected with the American Lyceum Association. In recent times this movement has been replaced by the Chautauqua movement and the University Extension (*qq.v.*). In some respects public lecturing has become more closely allied with public amusement than with education. At present in the United States there are about 12,000 towns and cities organized as lyceum centers. More than 40 lyceum bureaus furnish specialists who devote all or part of their time to this purpose, more than 750 of whom are organized with the International Lyceum Association. W. S. M.

LYCURGUS. — The Spartan lawgiver to whom is attributed the rigorous Spartan constitution. He is reputed to have lived in the ninth century B.C. It is, however, generally accepted now that the Spartan code was the result of laws and customs which had accumulated during centuries, and that Lycurgus was a mythical personage. It is clear that the constitution was not attributed to him until the end of the fifth century. Nor does the Spartan poet, Tyrtæus, make mention of him. It seems probable that Lycurgus was a local hero or deity worshiped as the protector against wolves (*Lyko-vorgos*, wolf-repeller), and that the code was attributed to him on the analogy of the lawgivers of later times.

See GREECE, ANCIENT.

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LYON, MARY (1797–1849). — Founder of Mount Holyoke College and a pioneer in the cause of the higher education of women in the United States. Born at Buckland, Mass., she was largely self-educated, as there were few opportunities in her girlhood for the secondary and higher education of women. This lack, together with a keen sense of the need, influenced her life and started her upon a career of educational reform that has given her rank among the greatest women America has produced. She attended the district schools in rural Massachusetts, and by the age of seventeen she was teaching in a common school near Shelburne Falls at a wage of seventy-five cents a week "with board." At the age of twenty she entered the Sanderson Academy at Ashfield, and during the next four years she alternately taught in the common schools and continued her studies at the Sanderson and Amherst academies. In 1821 she entered the higher school for girls conducted by Joseph Emerson (*q.v.*) at Byfield, and the next year she was an assistant teacher in Sanderson Academy. During 1824 and 1825 she taught part of each year in Adams Academy at Derry, N.H., and pursued courses of study for the remainder of the time at Amherst College and the Rensselaer Institute.

From 1826 to 1828 she continued her teaching during the winter at Sanderson Academy and during the summer at Adams Academy, which at this time was under the direction of Mrs. Zilpah Grant Banister (*q.v.*), one of Miss Lyon's teachers in Joseph Emerson's school at Byfield. In 1828 Mrs. Banister organized a seminary at Ipswich, Mass., and during the next two years Miss Lyon taught in the Ipswich Seminary during the summer and took charge of a "select school" at Buckland, Mass., during the winter. She became vice-principal of the Ipswich Seminary in 1830, and during the next four years gave all her time to this institution.

The "select" winter school at Buckland was in a sense the germ of Mount Holyoke. Her school was the resort of many girls who had been, or who expected to become, teachers. Expenses were made as low as possible. Tuition was $3 a quarter, and board was obtained at rates ranging from $1 to $1.25 a week. The philanthropic side of the work appealed strongly to Miss Lyon; and when in

1834 the Ipswich Seminary failed in its efforts to secure an endowment, she decided to enlist the interest of public-spirited people in the endowment of a seminary for the higher education of women. She secured the coöperation of a committee of prominent men, and a call was issued asking for one thousand dollars to finance the raising of the funds for the organization and endowment of the seminary. Miss Lyon undertook to secure this fund from women. Within two months the thousand dollars had been secured. Her former students, many of whom were now teachers, contributed a fourth of the sum, and the women in and about Ipswich the rest. Mount Holyoke was chartered in 1836 and opened the next year. (See Mount Holyoke College.)

During the twelve years (1837–1849) that Miss Lyon was president of the seminary, her work was distinctly that of a pioneer. Her institution was ridiculed and caricatured by the secular press of the country as "a rib-factory," "Protestant nunnery," etc. But she had faith in her mission, and her appeal to "the common sense, the intelligence, and the spirit of fair play," ultimately triumphed. As one of her biographers writes, "Mary Lyon viewed Mount Holyoke as a plant for development, not of intellectual gymnasts, but of enlightened, useful women." Coöperative housework was made a feature of the seminary, and the life of the institution was made thoroughly democratic. Sixty dollars a year covered board and tuition, exclusive of charges for fuel and light. She died at South Hadley, Mass., on March 5, 1849, and her remains were buried on the grounds of the institution which she had founded. Beyond a pamphlet on *Female Education* (1839), and the circulars stating the purpose and character of Mount Holyoke Seminary, Miss Lyon left no educational publications. W. S. M.

See also Mount Holyoke College; Women, Higher Education of, in the United States.

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LYONS, UNIVERSITY OF. — One of the most recently established universities in France. Although departments and faculties arose during the nineteenth century, they were not consolidated into a university until 1896. The claim that a *studium generale* existed at Lyons in the thirteenth century is denied by Rashdall (*Universities of Europe in the Middle Ages*), although there were undoubtedly very important schools there. Faculties of science and letters were established in 1808, but were again closed in 1816. The different faculties owed their origin in large measure to the public support and interest of public bodies. In 1834 the faculty of science was established, and in 1838 the faculty of letters. A chair in law was founded by the municipal council and the chamber of commerce; in 1867 the *École libre de Droit* was established, and became a faculty in 1875. Medical courses were given, in connection with the hospitals of the town in 1820, and in 1834 the *École libre de Médecine* was founded, and in 1841 this was followed by the *École préparatoire de Médecine et de Pharmacie.* The faculty was organized in 1877. The University of Lyons has always adapted itself to the needs and demands of a commercial and industrial city, which on its side has always been ready with its financial support. There are now four faculties: law, science, letters, medicine and pharmacy; and two schools: *École de Chimie industrielle* and *École de Tannerie.* The enrollment in 1910 was 2922 (law, 853; medicine, 953; pharmacy, 148; science, 511; letters, 436). For the organization see France, Education in.

MacVICAR, MALCOLM (1829–1904). — Normal school principal; educated at Knox College and the University of Rochester, he graduated from the latter institution in 1859. He was principal of the Brockport Collegiate Institute, which afterwards became the Brockport Normal School; principal of the New York State Normal School at Potsdam, and principal of the Michigan State Normal School at Ypsilanti. In 1888 he became the first chancellor of MacMaster University. He was the inventor of the MacVicar tellurian globe and the author of a popular series of textbooks on arithmetic. W. S. M.

McCORMICK THEOLOGICAL SEMINARY, CHICAGO, ILL. — An institution for the training of candidates for the ministry under the Presbytarian Church in the U.S.A., founded originally in 1830 as a branch of Hanover College, removed to New Albany in 1840, and 1859 to Chicago. The present name was adopted in 1886. Students are admitted on completing a regular college course. The Seminary offers two three-year courses leading to a diploma or the B.D. degree.

McCOSH, JAMES (1811–1894). — Philosopher and educator, born in Ayrshire, and educated at Glasgow and Edinburgh universities. In 1834 he became a minister, and assisted in establishing the Free Church of Scotland. In 1850 he published *The Method of Divine Government, physical and moral,* which led to his appointment as professor of logic and metaphysics at Queen's University, Belfast. Here he remained until 1868, playing an important part in the social and philanthropic work of the town. In 1868 he was invited to become president of Princeton College (*q.v.*), an office which he held until 1888, when he still continued his connection with the college as professor of philosophy. McCosh wrote numerous philosophical works, including: *Institutions of the Mind inductively investigated* (1860); *An Examination of Mill's Philosophy* (1866); *Scottish Philosophy, Bibliographical and Critical* (1874); *Psychology of the Cognitive Powers* (1886); *Psychology of the Motive Powers* (1889); *Realistic Philosophy defended* (1887). Dr. McCosh lived at Princeton until his death on Nov. 16, 1894.

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McELLIGOTT, JAMES NAPOLEON (1812–1866). — Textbook author. He studied at New York University and was principal of the School of Mechanics and Tradesmen in New York; became president of the New York Teachers' Association in 1849 and was editor of the *Teachers' Advocate.* He published many textbooks on spelling, reading, grammar, elocution, and Latin. W. S. M.

McGILL COLLEGE AND UNIVERSITY, MONTREAL, CANADA. — Founded by the will of the Hon. James McGill (*d.* 1813) and chartered in 1821. Work was begun in 1829 with faculties of arts and medicine and was carried on for some time under great difficulties. In 1852 through the efforts of some citizens of Montreal an amended charter was secured; a faculty of law was added in 1852; a faculty of applied science was organized in 1878, although engineering had been taught since 1856; the faculty of agriculture was established in 1907. The supreme authority of the university is vested in the Crown with the Governor-general of Canada as visitor. The governors of the university are the members of the royal institution for the advancement of learning and the president of the governors is *ex officio* Chancellor of the University. The chief academic and administrative officer is the Principal. With McGill are affiliated a number of other institutions, *e.g.* Macdonald College (*q.v.*), McGill University College of British Columbia, Vancouver, B.C., and Victoria, B.C., Mount Allison and Acadia universities, and several theological colleges. Students in the affiliated institutions may pursue their studies either wholly there or in part in the affiliated colleges and in part at McGill, and receive their degrees on passing the examinations of McGill. In 1899 the Royal Victoria College for Women was established, providing opportunities for residence and college life for women, who are admitted only to the arts courses at McGill. This institution offers courses in arts and pure science, given by professors and lecturers of the university. The students of this college are students of the university. All the usual university degrees are conferred by McGill on properly matriculated students who have completed the requirements of their courses. The total enrollment of students in 1911–1912 in McGill University and the affiliated colleges in British Columbia was 2484.

McGUFFEY, WILLIAM HOLMES (1800–1873.) — Textbook author. He was graduated from Washington College, Pa., in 1826; was professor in Miami University (1826–1836); president of Cincinnati College (1836–1839); president of Ohio University (1839–1843), and professor in the University of Virginia (1843–1873). He was the author of the widely used "Eclectic" readers and other schoolbooks. W. S. M.

McKEEN, JOSEPH (1757–1807). — First president of Bowdoin College. He was graduated from Dartmouth College in 1774; taught eight years in the schools of New Hampshire and three years in the academy at Andover, Mass. He was pastor of a church at Beverly, Mass., for seventeen years, and president of Bowdoin College from 1801 to 1807. He advocated the introduction of scientific studies into the college course. W. S. M.
See BOWDOIN COLLEGE.

McKEEN, JOSEPH (1791–1856). — School superintendent. For many years he was engaged in public and private school work in New York City. For ten years (1844–1854) he was superintendent of the schools of New York City and for two years was associated with S. S. Randall (*q.v.*) as assistant superintendent. He edited for some years the *Teachers' Advocate* and was one of the organizers of the New York Teachers' Association, and its president in 1846. W. S. M.

McKENDREE COLLEGE, LEBANON, ILL. — A coeducational institution founded in 1828, and maintaining academic, collegiate, domestic science, agriculture, expression, and music departments. Students are admitted from accredited high schools or by examination. The degrees of A.B., B.S., and B. Mus. are conferred by the institution. The enrollment in 1910–1911 was 279 in all departments. There is a teaching staff of seventeen members.

McLEAN, JOHN (1800–1886). — College president. He was graduated from Princeton in 1816 and two years later from the Princeton Theological Seminary. He was a professor at Princeton (1822–1854) and president of the institution (1854–1868). He wrote *School System of New Jersey* (1829) and *History of the College of New Jersey* (1877). W. S. M.

McMASTER UNIVERSITY, TORONTO, ONT. — A coeducational institution organized in 1887 under the auspices of the Baptist churches of Ontario and Quebec. The following courses leading to their respective degrees are offered: arts, science, and theology. Students are admitted on passing the matriculation examination. The enrollment in 1911–1912 was 300. The faculty consists of twenty-three members.

McMINNVILLE COLLEGE, McMINNVILLE, ORE. — A coeducational institution under the auspices of the Baptist denomination, chartered in 1858. Preparatory, collegiate, music, and commercial departments are maintained. Students are admitted to the College from four-year high schools. Classical, philosophical, and scientific courses are offered, leading to the degrees of A.B., B.Ph., and B.S. In 1910–1911 the enrollment in the college proper was forty students. The faculty consists of fifteen members.

McMURTRIE, HENRY (1793–1865). — Author of science textbooks. He was graduated from the University of Pennsylvania in 1814, and for many years was a professor in the medical department of that institution. He wrote textbooks in physiology, botany, zoölogy, hygiene, astronomy, and physics. W. S. M.

McPHERSON COLLEGE, McPHERSON, KANS. — A coeducational institution maintained by the Church of the Brethren with academic, collegiate, bible, education, and fine arts departments. The entrance requirements are fifteen units. The A.B. and B.S. degrees are conferred. Pre-medical and pre-engineering courses are also offered. The enrollment in the collegiate department in 1909–1910 was forty-five. There is a teaching staff of twenty-seven members.

MACALESTER COLLEGE, ST. PAUL, MINN. — A coeducational institution, the outgrowth of Baldwin School, established in 1853; opened as a college under the Synod of the Presbyterian Church of Minnesota in 1885. A preparatory school and college of liberal arts, requiring fifteen units of high school work for entrance, are maintained. The degrees of A.B. and B.S. are granted on completion of appropriate courses. In 1911–1912 there were 190 students in the college proper, and the faculty numbered twenty members.

MACDONALD COLLEGE (McGILL UNIVERSITY), ST. ANNE DE BELLEVUE, QUE. — A constituent body of McGill University founded and endowed by Sir William C. Macdonald for the advancement of education and research with special reference to rural problems, and for the training of teachers for rural districts. The work is distributed between the school of agriculture, school for teachers, and school of household science. In the school of agriculture the degree of B.S.A. is conferred on the completion of a four-year course. The faculty consists of fifty-five members, and the enrollment of students in 1911–1912 was 478.

MACDONALD MOVEMENT. — See CANADA, EDUCATION IN.

MACERATA ROYAL UNIVERSITY, ITALY. — See ITALY, EDUCATION IN.

MACKEY, JOHN (1765–1831). — Author of school arithmetics. He was educated as a physician and practiced medicine a few years. From 1817 to the time of his death he was engaged in teaching. He wrote the *American Teacher's Assistant and Self Instructor's Guide* (1826), a textbook in arithmetic that was widely used. W. S. M.

MACLURE, WILLIAM (1763–1840). — First American disciple of Pestalozzianism. He was born at Ayr, Scotland, and engaged in commerical pursuits. Having acquired a competence, he retired from business in 1803 and took up his residence in Philadelphia. Soon after he was sent to Paris by President Jefferson as a member of the commission to settle the claims of American citizens against the French government for spoliations committed during the French revolution. While in Europe he began the collection of objects for a museum of natural history for the United States, and made an extensive study of educational systems in the old world. Having visited Pestalozzi at Yverdon and Fellenberg (*q.v.*) at Hofwyl, he induced Joseph Neef (*q.v.*), one of Pestalozzi's former associates, to come to America and establish schools after the pattern of the Swiss reformer.

The first accounts of Pestalozzi's labors published in the United States were from the pen of Mr. Maclure. After his return to America in 1806, he began at his own expense a geological survey of the United States. Returning to Europe again in 1819 to study the industrial and educational schemes of Robert Owen (*q.v.*) at New Lanark, Scotland, he organized in the next year an industrial and agricultural school at Alicante, Spain. The overthrow of the constitutional government in 1824 and the confiscation of his property compelled him to give up his scheme for industrial education in Spain. Returning to the United States, he joined Robert Owen (*q.v.*) and his Utopian colony at New Harmony, Ind. Maclure invested $150,000 in the New Harmony experiment, and aimed to make it the center of Pestalozzianism in America. Joseph Neef was placed at the head of the schools of the colony, and manual training and elementary science were made important features of the school course. With the failure of the colony in 1826 Mr. Maclure continued to live at New Harmony, engaged in literary and scientific labors. He was the moving spirit in the organization of the Academy of Natural Sciences at Philadelphia in 1812, and its president from 1817 to the time of his death; and he was the virtual founder and the first president of the American Geological Society (out of which grew the American Association for the Advancement of Science) in 1828. His *Opinions on Various Subjects* (New Harmony, 1831) contains twenty essays on education. W. S. M.

See Pestalozzianism in America.

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MADAGASCAR. — See French Colonies, Education in.

MADISON, JAMES (1749–1812). — College president and bishop; graduated at William and Mary College, 1768; studied law and was admitted to the bar. He held a professorship at William and Mary College from 1773 to 1777, and was president of the college from 1777 to 1812. He advocated elective studies in collegiate institutions, and shared many of the views of Thomas Jefferson (*q.v.*) on higher education. W. S. M.

MADISON, JAMES (1751–1833). — President of the United States; was educated at Princeton; tutored for a time in his father's family; was long a trustee of William and Mary College; succeeded Thomas Jefferson as rector of the University of Virginia, having previously been a member of the board of trustees. President Madison was active in the movement for the establishment of public school systems, and shared the views of Jefferson (*q.v.*). W. S. M.

MADRAS SYSTEM. — See Monitorial System; Bell, Andrew; Lancaster.

MADRAS, UNIVERSITY OF. — See India, Education in.

MADRID, UNIVERSITY OF, SPAIN. — See Spain, Education in.

MAGER, KARL WILHELM (1810–1858). — A prominent German educator, was born in Gräfrath, near Solingen, in the Rhine province. From 1828 to 1830 he studied philology and philosophy at the university of Bonn and then went to Paris, where he devoted three years to a thorough study of French literature. Returning to Berlin, he made the acquaintance of Alexander von Humboldt and accompanied him on a scientific journey to Russia (1835). In Berlin he also came in contact with Diesterweg (*q.v.*), with whom he spent much time in discussing problems of education. In 1837 he was called as professor of German to the College at Geneva, but a nervous trouble and the desire for more leisure to do literary work induced him to give up his position (1839). He returned to Germany and started (1840) the *Pädagogische Revue*, to which his own contributions, written in a brilliant style, soon brought a large following. In 1841 he was called as professor of French literature to Aarau in Switzerland, but he left this position in 1844, because he found again that it took too much time away from his literary activity. In 1848 he was offered the principalship of the Realgymnasium at Eisenach, and accepted the call. But this new attempt to enter into the regular school service was also destined to be of short duration.

Mager's claim to a permanent place in the history of German education rests chiefly on his book, *Die deutsche Bürgerschule* (Stuttgart, 1840), which forms an epoch in the history of realistic institutions in Germany. It formulates the idea of a school with a modern education, which should meet the demands of the broad educated middle class of the people. With a firm hand Mager traces the outlines of the whole organization of such a school, and one may say that the modern educational institutions of the realistic type, such as the "Oberrealschule," are practically a realization of his plans.

Another important work of Mager is his *Genetische Methode des schulmässigen Unterrichts in fremden Sprachen und Literaturen* (*Genetic method of school instruction in foreign languages and literatures*, Zürich, 1846), which had considerable influence on the teaching of languages, both foreign and the mother tongue. F. M.

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MAGIC. — The art of controlling events by means of secret or supernatural formulas or agencies. The history of magic is of interest to the student of education and of psychology because magic is an early stage of science and religion. When men were ignorant of the laws of nature, any one who could bring about unfamiliar occurrences was looked upon with wonder. Thus the early priests were undoubtedly familiar with some of the simple principles of optics and they were able to produce by means of concave reflecting surfaces illusions now so familiar through the use of projection lanterns of all kinds. This command of optics was so far beyond the knowledge of the ordinary people that it gave the priests extraordinary influence over the ignorant observers, who regarded the phenomena as supernatural. Indeed, it may be doubted whether the priests themselves were altogether free from superstitious fear in the presence of the forces which they only partially understood and controlled. The usual belief of the spectator in these cases was that the phenomena were due to a spirit of some kind. Gradually, as science developed, natural forces came to be recognized as causes of the processes and the possibilities of magic disappeared.

Whatever may have been the attitude of the earlier masters of magic, there grew up in every tribe a band of professional magicians. These were more or less closely related to the priests. At first they were priests, but gradually religion and magic separated. The magician consciously extended his personal control over nature, and hid his operations from his fellows. In many respects, the magician under the various forms in which he appeared was the teacher of primitive peoples. Very frequently he used his special knowledge for baneful purposes. The magician came to be a person to be shunned and hated. He was indeed sought and employed in emergencies, but for the most part, he was an outcast. He cultivated, however, in a crude way, a knowledge of nature, and thus laid the foundations for our modern sciences. Alchemy and the practices of the medicine man are conspicuous examples of magic which have developed into sciences.

On the psychological side, belief in magic is a clear mark of general ignorance. Man when ignorant of the real forces back of phenomena imagines mysterious forces, and thus satisfies his need for explanation. As explanation grows more complete and systematic, belief in magic is reduced. C. H. J.

See Primitive Peoples, Education Among.

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MAGIC LANTERNS IN SCHOOL. — See Visual Aids to Teacher.

MAGILL, EDWARD HICKS (1825–1907). — College president and textbook author. He was graduated from Brown University in 1852; was head of the classical department of the Providence High School (1852–1859); submaster of the Boston Latin School (1859–1867), and headmaster of the preparatory department of Swarthmore College in 1871 and held this post for eighteen years. From 1889 to 1900 he was professor of French at Swarthmore. His published writings include *Coeducation of the Sexes* (1867), *Methods of Teaching Modern Languages* (1871), *History of Education in the Society of Friends* (1884), and a series of French textbooks. W. S. M.

See Swarthmore College.

MAGISTER SCHOLARUM. — See Bishop's Schools; Cathedral Schools; Church Schools; Master, School.

MAGNETISM, ANIMAL. — See Mesmerism.

MAHAN, ADRIAN (1800–1889). — College president. He was graduated from Hamilton College in 1824, and three years later from the Andover Theological Seminary. He was ordained to the ministry of the Congregational church in 1829, and served as a pastor for six years. Becoming the first president of Oberlin College in 1835, he held this position for fifteen years. He was president of Cleveland University from 1850 to 1854, and professor and president of Adrian College from 1857 to 1871. He wrote several works on mental philosophy, ethics, theology, and numerous articles in educational and religious journals. W. S. M.

See Oberlin College.

MAHAN, DENNIS HART (1802–1871). — Author of mathematical and scientific books. He was graduated from the United States Military Academy in 1824, and later studied at the Military School of Engineers and Artillery at Metz, France. He was professor of engineering and mathematics at the Military Academy at West Point from 1825 to 1871. His published works include treatises on geometry, engineering, and military science. W. S. M.

MAHĀVĪRĀRCĀYA. — One of the four great mathematical teachers of India He probably lived in the court of one of the old Rāshtrakūta monarchs who ruled over what is now the kingdom of Mysore, and whose name is given as Amoghavarsha Nripatunga. This king reigned in the first half of the ninth century, so that the date of Mahāvīrārcāya's treatise is about 850 A.D. The work is entitled *Ganita-Sara-Sangraha*, and consists of nine chapters, chiefly on algebra, but containing some arithmetic, a little mensuration, and the rudiments of a crude trigonometry. D. E. S.

MAIDWELL, LEWIS. — An educational projector of academies and schools from 1700 to 1705. He was educated at Westminster School under Busby, and at St. John's College, Cambridge, graduating B.A. in 1671. He was a private tutor for five years. In 1700 Maidwell presented a scheme to the House of Commons for an academy for forty scholars, sons of gentlemen from thirteen to seventeen, to have a free education in languages, arts, and physical exercises. He offered his house in Westminster for the purpose. The subjects were to be Latin, Greek, French, Arithmetic, and the use of the globes. He offered £300 a year for four fellowships to be held at the universities besides schemes for scholarships tenable at the University or on board his Majesty's ships of war, to be instructed in navigation. Maidwell did not succeed in obtaining support for this scheme which was remodelled so as to suggest a school instead of an academy, but without success. In 1705 he wrote *An Essay upon the Necessity and Excellency of Education, with an Account of Erecting the Royal Mathematical School*, in which he urges the establishment of a system of naval education and draws up a scheme to promote the art of navigation.

In 1707 Maidwell published his *Nova Grammatices Experimenta, or Some New Essays of a Natural and Artificial Grammar, which first demonstrates the Natural Rudiments of All Languages; and then by an Artificial Method, Facilitates the Perfect Knowledge of the English and Latin Tongues, without the Taedious Perplexitys of Common Grammar.* This is introduced with a poem by the poet laureate, Nahum Tate. It is a glorification (on the pretext of writing a Grammar) of Queen Anne and the Lord Godolphin, Lord High Treasurer, for whose grandson the curious book is written.

F. W.

See Academy.

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MAIMONIDES, MOSES BEN (1135–1204). — The most eminent Jewish rabbi and philosopher of the Middle Ages, born in Cordova, Spain, and died in Cairo, Egypt. His unusual training in medicine, philosophy, and theology was possible owing to the Arabian revival of learning in southwestern Europe. The Mohammedan persecution of Jews finally drove out his family, which took flight to Egypt. Here Maimonides became influential, and eventually physician to the Sultan. He was an active author, writing in both Hebrew and Arabic. His greatest rabbinical book is the *Mishneh Torah* or *Yad ha-Hazakah*, containing a complete presentation of Talmudic Judaism. It has been the center of much controversy, and has lived through many editions, parts of it having been translated into Latin and English. His most important philosophical work is the *Guide to the Perplexed* (*Moreh Nebukim*), written originally in Arabic. In this book he made the effort to expound the principles of Judaism and those of Greek philosophy, chiefly the Aristotelian, so as to justify the former by the latter.

E. F. B.

See Jewish Education.

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MAINE DE BIRAN (1766–1824). — Regarded by Victor Cousin as the greatest French metaphysician since Malebranche. Early in life he abandoned politics and the army for philosophy and won a prize from the Institute by his *Essai sur l'habitude.* He was a determined opponent of eighteenth century philosophy. He passed through three stages of belief; first belonging to the sensational school of Condillac, he later developed a system of his own, based upon internal reflection as the only legitimate method in philosophy. Finally he abandoned the standpoint of psychological experience for that of mystical intuition, in which the life of sensation and volition is absorbed in a life of love and communion with God. His literary style is heavy and his writings have been slow in securing the attention which they merit.

W. R.

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MAINE, STATE OF. — A part of Massachusetts up to 1820, when it was admitted to the Union as the twenty-third state. It is in the North Atlantic Division, and the most northeasterly of the states. It has a land area of 29,895 square miles, being almost as large as the other five New England states combined. For administrative purposes, the state is divided into sixteen counties, and these in turn into towns. The county is of practically no educational importance, the state dealing directly with the towns in educational matters. In 1910 Maine had a population of 742,371, and a density of population of 24.8 per square mile.

Educational History. — The first record of a school in what is now the state of Maine was in the town of York in 1701, when Nathaniel Freeman was employed as a teacher. The town of Wells opened the second school in 1716. In 1725 the first public schoolhouse in the territory was built at York. Other early schools were opened at Portland in 1728; Buxton in 1761; New Gloucester in 1764; Machias in 1774; Canaar in 1778; Norridgewock in 1779; Union in 1785; and Castine in 1796. The first grammar school was opened in Portland in 1738. The Massachusetts laws of 1642 and 1647 (see Massachusetts) had applied to the territory of Maine as well, but had been difficult of enforcement there. Situated on the frontier, with constant trouble with the Indians, schools and education made but slow progress, and many towns were " presented " for failure to comply with the law. By 1800 there were 161 organized towns, with grammar schools in seven.

On the admission of Maine into the Union as a separate state in 1820, the constitution then adopted required the towns to make suitable provision for the support of schools, and safeguarded the interests of Bowdoin College. This constitution is still in force. The district system, established by the Massachusetts law of 1789, was fixed, and remained for a little more than a century before it was abolished.

The new state school law of 1821 organized the system. It provided that every town and plantation must raise forty cents per inhabitant for schools; directed that competent masters should be employed, but permitted one third of the funds to be spent for a schoolmistress; directed every town to choose a superintending school committee of from three to seven to examine teachers, visit schools, dismiss incompetent teachers, determine the studies, and select the textbooks; provided for an agent in each school district to hire teachers and to provide fuel; declared each school district a body corporate, with power to locate school buildings and levy taxes; and for the division of the town school money among the districts on the basis of the number of children in the district, four to twenty-one years of age. In 1822 the town of Portland was permitted to organize under a special law, which permitted it to abolish the district organization and established a graded school. Bath in 1828 and Bangor in 1832 received similar permission. In this same legislature that granted town organization to Portland, the districts made an unsuccessful attempt to secure the power to appoint their own district agents, and thus make them practically independent of the towns.

A new law in 1825 made the selection of a superintending school committee mandatory, under fine for failure; gave the committee power to expel unruly scholars; required them to visit schools twice each year; ordered a school census to be taken each year, and school statistics to be reported once in three years; and allowed an expenditure of 10 per cent of the school money for fuel and repairs. In 1827 union town schools were authorized, and the beginnings of a system of grading made by allowing committees to determine what scholars should attend the master's and what the mistress' school. In 1834 the laws were revised and reënacted as one school code. The maximum number constituting a school committee was cut from seven to five, the committees were required to report to an annual school meeting, and permission was given to any town to abolish districts and organize itself under the town system.

Up to this time the development had been town and district development only. In 1843 and again in 1845 unsuccessful efforts were made to unify the system, but it was not until 1893 that this was accomplished by the abolition of the district system. In 1846 a State Board of Education was created, consisting of one representative from each county, elected by the town school committees. This Board was to elect a secretary, whose duties were much the same as those of the Secretary of the Massachusetts State Board. The next year the first reasonably accurate statistics were collected. The year following, teachers' institutes were established in every county; school committees reduced from five to three, one to be elected each year; union district graded schools permitted; by-laws against truancy authorized; requirements for teachers' certificates increased; and the powers and duties of town and school committees enlarged. In 1852 this State Board and the office of Secretary were abolished, chiefly because the Board was not politically useful. County school commissioners, to be appointed by the Governor for one-year terms, were created instead, each to give fifty days of service annually, and to make an annual report to the legislature. This proving unsatisfactory, the legislature of 1854 abolished the county commissions and created the office of State Superintendent of Public Instruction, the Governor and Council to appoint, for three-year terms. This method of state supervision has continued to the present time. County supervision was again established in 1869 by the creation of county supervisors of schools, but they were abolished in 1872 and have not since been re-created. To the new Superintendent was assigned about the same duties as given formerly to the Secretary of the State Board. The new Superintendent was required to hold a county teachers' convention in each county each year, and $2000 was appropriated as aid to this end. In 1858 a teachers' institute in each county and a state teachers' convention were ordered. In 1859 the first State Teachers' Association to form a permanent organization met at Waterville.

In 1828 the beginnings of a school fund were made. Twenty townships were set aside to constitute a school fund; in 1834 these were sold for $110,000; and in 1848 the interest on this sum, at 6 per cent, was distributed to the towns. In 1856 twenty-four and one half townships were set aside for the same purpose; in 1864 the timber on ten additional townships of land; and in 1903 the money arising from the sale of timber and grass, or from trespasses on reserved lands, were added to the school fund. A bank tax of 1 per cent for educational purposes was levied in 1833, to be apportioned to the towns on census. In 1865, because of the decrease in the revenue from the bank tax, due to the establishment of national banks, the town tax was raised from forty cents to seventy-five cents, and, in 1868, to a dollar per inhabitant. At the same time, a state tax of one mill was ordered for the benefit of schools, the income to be distributed to the towns on census. This was increased to one and one half mills, and in 1909 an additional state tax of one and one half mills, one third to be divided on census and two thirds on valuation, was ordered and an equalization fund of $20,000 was set aside. In 1872 the town tax was reduced from a dollar to eighty cents, and in 1909 to fifty-five cents.

In 1860 state aid was given to eighteen academies for the training of teachers, but was withdrawn in 1862 as unsatisfactory. Teachers' institutes were also abolished at the same time, and were not revived until 1869. In 1868 the University of Maine was opened at Orono. In 1863 the first two state normal schools were established, the one at Farmington being opened in 1864, and at Castine in 1867. A third was opened at Gorham in 1879, a fourth at Presque Isle in 1905, and a fifth was authorized in 1909, and opened in 1911 at Machias. The Madawaska Training School at Fort Kent, in the extreme northern part of the state, was established in 1887. State summer schools for teachers were established in 1895, and in 1901 $2500 aid was given for the maintenance of four such schools. In 1873 a new high school law was enacted, whereby state aid up to a maximum of $500 was granted to free high schools. Seventy-one academies and higher institutions had been chartered up to this time, but the new law caused many of these institutions to transfer themselves to public control. In 1879 the law was suspended for one year; in 1880 the state aid was reduced to $250 and the teaching of ancient languages at state expense forbidden; and in 1909 a graded system of state aid for high schools, varying from $450 to $850, with state inspection, was substituted for the 1880 law. State aid to academies, up to $250, was also granted for instruction in manual training, domestic science, and agriculture.

In 1875 a compulsory education law, which required three months' attendance of all children, 9–15 years of age, was enacted. The requirements have been increased since then to include all children from 6–17. In 1909 a combined compulsory education and child labor law was enacted, similar to such laws in the other New England States. In 1892 the constitution of the state was amended so as to grant the right of suffrage only to those who are able to read the constitution of the state in the English language and to write their names. In 1895 a system of state examinations for teachers' certificates was established. In 1897 a state school for the deaf and a state school for the feeble-minded were established. In 1909 school physicians were provided for; the State Superintendent was instructed to furnish plans and specifications for all school buildings of not over four rooms; and other measures of importance, mentioned above, were enacted. In 1911 the State Superintendent was instructed to investigate the needs for industrial education, special courses were provided for in the state normal schools, and state aid was provided for high schools and industrial schools offering such instruction — $500 to high schools and $2000 to industrial schools.

Present School System. — At the head of the present school system is a State Superintendent of Public Instruction, appointed by the Governor with the concurrence of the Council, for three-year terms. He receives a salary of $2500 and traveling expenses. There is no State Board of Education or analogous body. The Superintendent has general supervision over the schools of the state; conducts county and summer training schools; prescribes the studies to be taught in the common schools; furnishes blanks, forms, and record books to the town school authorities; holds examinations for state teachers' certificates, prescribes the tests, issues the certificates, and keeps a record of those passing for the information of school authorities; grants certificates of qualification to town superintendents; assumes control of schools founded as the result of public bequests; approves unions of towns to employ a superintendent of schools; appoints school agents for unorganized territory; prepares directions for testing the sight and hearing of the school children of the state; issues such circulars of information as he deems desirable; examines all high schools, in person or by deputy, for grants of state aid; is an *ex officio* member of the State Board of Normal School Trustees, which controls the five normal schools of the state and the Madawaska Training School; determines the conditions for admission to these schools; receives the census and school reports from all the towns; and makes an annual report to the Governor and Council.

There are no county school authorities in Maine, the next unit below the state being the town. The schools of each town are under the control of a town school committee of three, one chosen by ballot each year at the annual meeting for a three-year term. Cities operating under special charters select boards of education, as provided for by the charter. It is the duty of the school committee to approve the course and subjects of instruction, with liberty to add to the studies prescribed by the State Superintendent; to select textbooks for five-year periods, furnish them to the schools, and contract with publishers as to the sale price for those sold to parents who wish to provide their own books; to dismiss teachers and to expel pupils for cause; to exclude unvaccinated children; to classify scholars; to determine the rates of tuition for those living outside the town; and to make rules and regulations for the government of the schools. All towns must provide free textbooks; must raise money for buildings and repairs; must provide a term of twenty-six weeks in all schools; may levy a tax for evening elementary schools; may provide for instruction in manual training and industrial and mechanical drawing. Two or more towns may unite to maintain a union elementary school, the towns paying in proportion to census. On recommendation of the school committee, towns, in annual meeting, may abolish or change schools. Schools of less than eight in average attendance may be suspended, and transportation and board may be paid for the pupils to attend elsewhere. Plantations have the same liability as towns for schools. The State Superintendent must appoint an agent for all unorganized territory, and, if there are two or more children in any unorganized territory, he shall arrange for their schooling there, or elsewhere.

Each school committee must annually elect a superintendent of schools, who acts for the committee in many matters which used to be attended to by the committees. He acts as secretary to the committee; employs all teachers, subject to the approval of the committee; oversees the annual school census; examines the schools and pupils at least twice each term; and makes a written report to the annual town meeting. Two or more towns, employing a total of twenty to fifty teachers, may unite to employ a superintendent, apportioning the expense in proportion to the service rendered the town. For such unions, the state will grant aid for the salary of the superintendent of twice the amount raised by the towns, with a maximum of $800. To towns and cities employing more than fifty teachers, the state will grant as aid two thirds of the amount raised, up to $800. All superintendents receiving such state aid must hold a state certificate for supervision.

School Support. — The Maine school fund, derived from the sources enumerated above, under *Educational History*, now amounts to about half a million dollars, and produces about 1 per cent of the total revenue for schools. A state tax of one mill on all property was levied in 1868, and in 1907 this was raised to one and one half mills. In 1909 an additional state tax of one and one half mills, and an equalization fund of $20,000 each year, were added, while at the same time the required local town tax was reduced from eighty cents to fifty-five cents per inhabitant. This will shift somewhat the burden of support from the towns to the state, and will tend to provide a greater equalization of educational burdens and opportunities. In 1911 the equalization fund was increased to $27,500. Of the state tax two thirds is distributed on the basis of the school census, five to twenty-one, and the remaining third on the basis of the valuation of the towns. To all towns that raise a tax of over four mills for schools, one tenth additional shall be added from the equalization fund. The remainder of all school money comes from local (town) taxation. State aid is also given to schools and towns providing industrial training.

The total amount expended for schools during the last year for which reports are available was $1,875,605; or a per capita of the total population expenditure of $2.52.

Educational Conditions. — Of the total population in 1910, 48.6 per cent lived in rural districts and 26.3 per cent in cities of over 8000 inhabitants. The illiteracy in 1900 was 5.1 per cent, while 99.7 per cent of the total population were of the white race, and 86.6 per cent were native born. In northern Maine, there are large areas which are very sparsely inhabited, and 59 unorganized townships, containing an average of less than fourteen children of school age in each, were reported in 1910. For such children, the law requires that the State Superintendent shall provide a teacher, transport them daily to another school, or bring them to a school and board them while attending. $1708 was expended for the board and transportation of such pupils in 1909–1910. Much has also been done in recent years in the consolidation of schools and the transportation of pupils, nearly 800 schools having been closed since 1900, and, in 1909–1910, 6051 pupils were transported and $114,795 was expended for transportation.

More than one half of the schools are ungraded, and one fifth of the schools were reported as not using a course of study. A little more than one school in six has a school library.

The state has good compulsory education and child labor laws, and the towns employed 862 truant officers to enforce the law. All children, seven to fourteen, must attend some school during the time the public schools are in session. The truant officer is to visit business establishments, look after truancy, and bring to trial those who violate the law. The state also provides medical inspection for the schools, and examines all pupils for common defects.

Teachers and Training. — The state employed 6905 teachers in 1909–1910. Of this number 17 per cent were beginners; 24 per cent were graduates of normal schools; and 22 per cent held state certificates. The remaining 78 per cent were certificated by the local town authorities. The average annual salaries for men teachers are about $300 and for women teachers about $230. These figures, and the conditions of state aid to teachers' institutes and high schools, indicate a low standard of pay for educational service.

For the training of teachers in service, the state provides that thirty or more teachers in any county may form an association and hold an annual convention, under the supervision of the State Superintendent. Teachers may receive pay for two days' attendance. The state agrees to pay all expenses, but the sum of $1000 only is appropriated to pay for all the institutes in the state each year. Four summer normals for teachers are also provided by the state, for which the sum of $2500 is appropriated. Five hundred and sixty-eight teachers attended these summer schools in 1910. Attendance at all institutes and associations is optional.

For the training of new teachers, the state maintains five regular normal schools, located at Farmington, Castine, Gorham, Presque Isle, and Machias. The state also maintains the Madawaska Training School at Fort Kent, in the extreme northern part of the state, for eight months each year, for the training of teachers to teach in the Madawaska District of northern Maine. These schools are under the control of a board of nine trustees, consisting of the Governor, State Superintendent of Public Instruction, and seven others appointed by the Governor.

Secondary Education. — By the new law of 1909 all free high schools are to be classified into three divisions as follows: *A*. At least one 4 year course, a 36 week term, proper laboratory equipment, at least two teachers employed, and a total taxation cost for maintenance of at least $850. *B*. At least one 2 year course, a 36 week term, proper laboratory equipment, and a total taxation cost for maintenance of at least $500. Tuition to be paid for pupils elsewhere for remaining two years. *C*. At least one 4 year course, for 30 weeks, and a total taxation cost for maintenance of at least $450. All schools are to be inspected for approval by the State Superintendent, with state aid of two thirds of the amount paid for instruction, up to a maximum state grant of $500.

Academies giving instruction equivalent to high schools, of which there were forty-eight on the accepted list, may receive aid, as follows:—

For an approved English course, $ 500.
For an approved College Preparatory course, in addition, $ 750.
For an approved Teachers' Training course, in addition, $ 1,000.
If academy's income is over $ 1,000, the maximum grant is $500.
If academy's income is over $1,600, no aid can be granted.

There were 552 teachers in the free high schools of the state in 1910, and 219 in the accredited academies.

Higher and Other Education. — The University of Maine, at Orono (*q.v.*), opened in 1868, offering instruction to both sexes in agriculture, English, education, and general scientific and literary studies, stands at the head of the school system of the state. This institution, however, has in the past received little support from the state. The instruction given is supplemented by that given in three other institutions, as follows: —

Bowdoin College, Brunswick, 1802, non-sectarian. Men.
Bates College, Lewiston, 1863; non-sectarian. Both sexes.
Colby College, Waterville, 1818, Baptist. Both sexes.

The state also maintains the Maine Industrial (Reformatory) School for Girls, at Hallowell; the Maine State (Reformatory) School for Boys, at Portland; the Maine State School for the Deaf, at Portland; the Maine State School for the Feeble-Minded (established in 1907); and the Bath Military and Naval Orphan Asylum. The state also pays for the education of its blind at the Perkins Institute for the Blind, in Boston. E. P. C.

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MAINE, UNIVERSITY OF, ORONO, ME. — A coeducational institution, founded as a result of the land grants of 1862 as a State College of Agriculture and the Mechanic Arts. The name was changed in 1897 to the University of Maine, as an integral part of the public educational system of the state. The university is maintained from the income of the several grants from Congress, the annual state appropriations, and student fees. The university is divided into the following colleges: arts and sciences, agriculture, technology, law; and an agricultural experiment station is maintained. The entrance requirements are fourteen units, except in the college of law. The university grants in the various departments of the college the degrees of B.A., B.S., LL.B., Ph.C. (Pharmaceutical Chemist), and master's degrees. Short courses are offered for farmers, teachers, and pharmacists. The enrollment in 1911–1912 was 896, distributed as follows: arts and science, 196; agriculture, 294; technology, 298; law, 108. The faculty numbers 106 members.

MAINTENON (MME. DE), FRANÇOISE D'AUBIGNÉ, MARQUISE DE MAINTENON (1635–1719). — The second wife of Louis XIV (1685). In the interval between the death of her first husband, Scarron, the poet, and her marriage to the king, she was installed as governess over the children of Mme. de Montespan and Louis XIV. This made it possible for her to buy the estate of Maintenon, later raised to a marquisate. She exercised a quiet, wholesome influence at a time when the French court life was anything but blameless. Inspired by an intense interest in children, she started a small establishment for poor girls, which subsequently grew into the school of Saint-Cyr (1686), destined for the education of daughters of impecunious noblemen, and one of the earliest attempts in France at the serious public education of girls. Racine's *Athalie* and *Esther* were written expressly for dramatic presentation by the girls of this institution. F. E. F.

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MAINZ, UNIVERSITY OF, GERMANY. — A university was founded at Mainz by a Bull of Pope Sixtus IV granted in 1476. A charter was given in 1477 by the Archbishop of Mainz, who had petitioned for the establishment of the university. A century later the university came under the control of the Jesuits, who remained there until the suppression of the Order in 1773. A reorganization took place in the same year; the university was endowed anew; and the teaching staff was increased and strengthened. The French aggression, however, put an end to these efforts, and the university was closed in 1798.

MAITTAIRE, MICHEL (1667–1747). — Educationist and author; was born in 1667 in France, of Huguenot parents. The father was naturalized in England in 1682, and the son was sent to Westminster School, under Dr. Busby. With Dr. South as patron, Maittaire was preferred to a studentship of Christ Church, Oxford. From 1695 to 1699, Maittaire was second master in his old school of Westminster. In 1699 he resigned his mastership and devoted himself entirely to literature, particularly undertaking bibliographical and philological researches and the editing of the classics with notes and indexes (among others the Greek text of Anacreon, with translations into Latin verse and prose). His native country was proud of his fame, and gave him a passport to prosecute his researches in Paris. He corresponded with all the *savants* of Europe, by whom he was respected for his erudition, character, and excellent temper and love of truth. In 1706 he published a book on the Greek dialects *in usum Scholæ Westmonasteriensis*, dedicated to the school. In 1709 appeared his *Stephanorum Historia*, an account of the lives and books issued by the old French Huguenot printers, the Estiennes. In 1712 was issued Maittaire's well-known *English Grammar*, written to afford a good training in English before beginning Latin studies. In 1717 he wrote *Historia typographorum aliquot Parisiensium*, and in 1719 began his valuable *Annales Typographici ab Artis inventæ origine*, the final volume of which was completed in 1741. In 1719 Maittaire published by subscription *Miscellanæ Græcorum aliquot Scriptorum carmina*. In 1732 he had edited and annotated a new edition of Selden's *Marmora Arundelliana.* In 1742 he published a collection of his own Latin poems under the title *Senilia*. He published an enormous number of editions of the classics, so that it is said his name began to be used in titles of books which he had not edited.

F. W.

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MAKIN, MRS. BATHSUA. — The author of the earliest treatise on women's education in England, written by a woman teacher. She was appointed, about 1641, teacher of Charles I's daughter, Elizabeth, then a child of six years of age. It is said that by eight years of age the child read and wrote in French, Italian, Latin, Greek, and Hebrew. Mrs. Makin appears to have conducted a school at Putney, and afterwards, in 1673, she established a girls' school at Tottenham High Cross, within four miles of London.

In the prospectus of this school, which is appended as a postscript to the *Essay* — probably the earliest extant prospectus of a girls' high school in England, she proposes to teach " all things ordinarily taught in other schools," viz. work of all sorts, needlework, dancing, music, singing, writing, keeping accounts, to take up half the school time; the other half time is for teaching the Latin and French tongues. Those that please may also learn Greek and Hebrew, Italian and Spanish. " In all which," adds the authoress, " this Gentlewoman (the announcement is throughout in the third person) hath a competent knowledge." Girls (" gentlewomen ") may be instructed at eight or nine at this school in a year or two (according to their abilities) in Latin and French. The Rules for the foreign languages will be accommodated to the grammar of the English language. " Repositories for Visibles," *i.e.* collections of specimens, shall be prepared. She had learned (from Comenius probably) that from " beholding the things " it will be more easy for gentlewomen to learn the names, natures, value and use of herbs, shrubs, trees, mineral juices, metals, and stones. Those that please may learn limning (drawing), preserving, pastry, and cookery. Those that will allow longer time may obtain some general knowledge in astronomy, geography, but especially in arithmetic and history. Girls are to take experimental philosophy, " and as to the other things named, more or fewer as they incline."

The prospectus is added to Mrs. Makin's single publication: *An Essay to Revive the Ancient Education of Gentlewomen*, 1673. This is a noteworthy tractate, showing that in former ages women have been educated in the arts and the sciences, and citing historical instances. Her tractate, especially in the logical treatment, is founded on a logical dissertation of Anna Maria Schurmann, of Utrecht, translated into English in 1659 by C. B., entitled: "The learned Maid, or whether a Maid may be a Scholar," a decidedly clever brochure. (See Una Birch, *Anna Van Schurmann.* London, 1909.) F. W.

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MALAY ARCHIPELAGO, EDUCATION IN.— See NETHERLANDS, COLONIES OF, EDUCATION IN THE.

MALCOLM, HOWARD (1799–1879). — College president. He studied at Dickinson College and the Princeton Theological Seminary. He was president of Georgetown College, Kentucky (1849–1851), and Bucknell University, at Lewisburg, Pa. (1851–1857), and for some years was secretary of the American Sunday School Union. He was the author of a dictionary of the Bible and numerous religious works. W. S. M.

MALE TEACHERS. — See TEACHERS, SEX OF.

MALEBRANCHE, NICOLAS (1638–1715). — One of the greatest French philosophers, who expected to enter the Church as his life work. Suffering from a weak constitution, and having a retiring disposition, he declined, after completing his studies at the Sorbonne, to become upon invitation a canon at Notre Dame in Paris. Instead he became a member of the Congregation of the Oratory of Jesus, an order that was opposed by the Society of Jesus. His talents lay dormant several years, while he was making ineffectual efforts with church history and Biblical criticism. Upon reading one of the works of Des Cartes (the *Traité de l'Homme*), which came to his hands by accident, he found his true calling. It is said that the Cartesian ideas so completely seized him that the reading had to be interrupted by reason of violent palpitation of the heart. In the course of a decade he wrote his chief work, the famous *De la Recherche de la Vérité* (1674). This and his other important works, *Christian and Metaphysical Meditation* (1683) and *Discussions on Metaphysics and Religion* (1688), were devoted to the completion of the development of Cartesianism which Malebranche's thinking accomplished. The interaction between mind and bodies was an unsolved problem left by Des Cartes. Malebranche solved it by applying the principle that "we see all things in God." God is known directly and immediately, as he is also the place of spirits. Things are in Him in archetypal form, which we perceive as ideas. Malebranche struggled against pantheism, and held to the freedom of man. The acute psychological analyses, which led to the support of his doctrine, especially in his first book, were also contributions to educational theory, quite as much as the rules (sixth book) which should be observed in the search of truth may be applied to the work of teaching. As a philosopher and an Oratorian, Malebranche aided greatly in extending the general educational benefits of the work of Des Cartes (*q.v.*). E. F. B.

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MALIM, WILLIAM (1533–1594). — Headmaster of Eton College and of St. Paul's School, London; probably was a native of Canterbury. He went to Eton College and King's College, Cambridge, where he graduated B.A. 1553, and M.A. in 1556. On entering on his duties at Eton (1561), he drew up in Latin a *Consuetudinarium*, which stated the rules and observances kept in the college at the beginning of the reign of Queen Elizabeth; the document is still extant at Corpus Christi College, Cambridge. The *Consuetudinarium* contains in the first part the special and exceptional customs observed at different parts of the year, and in the second a record of the daily routine of school life. (See ETON.) The incident of the flogging of the scholars at Eton, on hearing of which Ascham (*q.v.*) was prompted to write the *Scholemaster*, took place in the rule of Malim, who continued the flogging tradition of the former head, Nicholas Udall (*q.v.*). Malim remained at Eton until 1571. In 1573 he became headmaster of St. Paul's school, where he remained till 1581, and he is stated to have lived, after retirement, till 1594. Besides the *Consuetudinarium*, he edited the *De Republica Anglorum Instauranda* (1579) of Sir Thomas Chaloner and wrote a number of commendatory Latin verses or letters to the literary work of friends. F. W.

See ETON COLLEGE.

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MALTA, EDUCATION IN. — Malta, with the adjacent island of Gozo, comprises an area of 117 square miles and a population of 215,879, chiefly Italian. The island was taken by the British in 1800 and formally ceded to Great Britain in 1804. The modern system of education may be said to date from 1835, when a royal commission was appointed to inquire into the existing provision for the education of the native population. Three elementary schools were in operation at the time, supported by the government; one at Valletta, the chief town, one at Senglea, and one at Gozo. About 720 children were in attendance, and the annual expenditure for the schools was £400 ($2000).

Ten new schools, comprising two departments each, one for boys, the other for girls, were opened, and an appropriation of £850 per annum was made for their support. At the time the rector of the university was charged with the control of primary schools. In 1844 this relation ceased by the creation of the office of Director of Primary Education. Subsequently the office was extended to include all departments of education, and a special service of inspection was created for elementary schools. This service has been well maintained, and as regards number the provision of schools is quite adequate. According to the official report for 1910, there were thirty-eight elementary schools for boys, thirty-two for girls, and nine for infants (boys and girls). The enrollment was 19,360, or very nearly 9 per cent of the population; the teaching staff numbered 739, and the expenditure for the schools amounted to £27,532 ($133,805), borne by the government.

The schools are regularly inspected and an annual examination made of all pupils. Parents and guardians are allowed to make choice of either English or Italian as the language of colloquial instruction for their children in the infant and the elementary schools up to Grade Three. The choice for 1910 gave preference to English in respect to 96.3 per cent of all pupils. Drawing, modeling, and woodcarving are included in the program of studies, and needlework in schools for girls. The catechism of the Roman Catholic Church is also taught in deference to the religious convictions of 90 per cent of the families represented in the schools. In addition to the regular day schools, one public Sunday school for secular instruction and thirty-three night schools were reported for 1910–1911. In the principal towns night drawing classes are supported, and many pupils from these classes enter as candidates for the South Kensington examinations.

There are two public secondary schools, one for girls at Valletta, having about 250 pupils, and the second for boys at Gozo, with an enrollment of sixty students. The former offers modern languages and the usual literary branches; the latter, a Latin scientific course. The Lyceum is a secondary school of the highest order, having a full classical course. Students are admitted by examination and prepare for the university faculties. The Lyceum enrolls generally between four and five hundred students (470 in 1909). There are also five private secondary schools with courses of instruction leading to the university, a school of marine engineering, with twenty-four students, and a school of electrical engineering with thirty-eight students.

The University of Malta was established in 1769 by Grand Master Pinto in the buildings previously occupied by a college founded by the Jesuits in 1602. The present organization of the university dates from a statute of 1898 which placed it under the direction of a rector assisted by a council in which the government and the university faculties are represented. There are four faculties, among which the students were distributed as follows in 1909: theology, 17; law, 38; medicine, 15; literature and science, 88; total, 158. The university is an important center for meteorological observations, the returns of which are daily interchanged with those of the other Mediterranean stations and constant interchange maintained, also, with the chief stations of Europe. The Argotti Botanical Gardens also form an important scientific adjunct of the university.

The government expenditure for secondary and university education in 1909–1910 was £10,236, which, with the appropriation for elementary schools and £1442 for the office expenses, gave a total of £39,210 ($190,560).

A. T. S.

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MALVERN COLLEGE. — See GRAMMAR SCHOOL; COLLEGE; COLLEGE, ENGLISH; PUBLIC SCHOOLS.

MAN, ISLE OF, EDUCATION IN. — From early times there existed in the Isle of Man, as elsewhere, parochial church schools; but the island is chiefly remarkable for the earliest educational experiment in compulsory education. At the very time that education in England was falling into its worst period, the Manx clergy and the King of Man (Lord Derby) gave the island a statutory system of education. This act was first passed in the shape of articles at a convocation of the clergy at Bishop's Court on Feb. 3, 1703–1704; it was approved at a Tynwald Court the next day, and confirmed by Lord Derby; and on June 6, 1704, was publicly proclaimed upon the Tynwald Hill according to ancient form and custom. It was a compulsory act: "all persons shall be obliged to send their children as soon as they are capable of receiving instruction to some petty school, and to continue them there until the said children can read English distinctly." The parents who neglected the duty were subject to fine, if duly "presented" for neglect by the minister, churchwardens, or Chapter Quest; moreover, the fine was to be inflicted if the children were not sent regularly. The fees were sixpence quarterly, if only reading were taught, and ninepence, if writing were included. The fees could be recovered by regular process. But the education was to be free, if the parents or relations were duly certified as poor persons. Exception as to regular attendance was made, if the children were needed at home in harvest time. It is interesting to note this provision was followed in the English Elementary Education Act of 1876 (Section 9). Children so allowed leave of absence had to receive special Sunday instruction every third Sunday at the parish church from the schoolmaster at least an hour before evening service. The act provided for efficient schoolmasters and for the quarterly inspection of the schools. It proved efficient, but it was found necessary by an act of 1813 to increase the fees to 2*s.* 11*d.* a quarter for every child that learned English only, while 3*s.* 6*d.* was charged for each scholar taught to read and write. The lower scale was "altogether inadequate in the present day." Soon after this the National Society (*q.v.*) began to make grants to the schools, and nine school building grants were made by the English Treasury between 1835 and 1840. The Manx legislature in 1881 passed a further act to make better provision for schoolmasters and school management. By an act of 1872 an education board and school committees were formed, and the principles of the English act of 1870 were adopted. An act of 1878 made education compulsory under the new system, and further acts were passed in 1881 and 1884. The law was amended and consolidated by an act of 1893, which defined the term "elementary education." This act was amended in 1898, and by an act of 1899 the present Council of Education assumed control. The Manx authorities in many ways have offered an historical object lesson in education to modern educational areas. J. E. G. de M.

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MANAGEMENT, CLASS. — See SCHOOL and CLASS MANAGEMENT.

MANAGEMENT, SCHOOL. — See SCHOOL and CLASS MANAGEMENT.

MANCHESTER COLLEGE, NORTH MANCHESTER, IND. — A coeducational institution founded in 1889 under the control of the Church of the Brethren. Academic, Bible, collegiate, normal, music, and business departments are maintained. Students are admitted on completion of a high school course. The A.B. degree is conferred. The teaching staff consists of twenty members.

MANCHESTER, UNIVERSITY OF, MANCHESTER, ENGLAND. — One of the recently founded English universities. It was established in 1851 by will of John Owens as the Owens College for the purpose of "providing or aiding the means of instructing and improving young persons of the male sex (and being of an age not less than fourteen years) in such branches of learning and science as are now, and may be hereafter, usually taught in the English universities." Another object of the foundation was to furnish an institution of learning free from denominational tests and subscriptions, to which Owens was opposed. At the time there was no place except the University College, London, which satisfied these requirements. Thus the college marked the beginning of a new era in higher education in England, and paved the way for some twelve other similar institutions established in populous commercial and industrial centers. Work was begun in Quay Street, in a house which was formerly the residence of Richard Cobden, in 1851 with A. J. Scott as the first principal, assisted by four professors and two teachers. The first scholarships (Victoria and Wellington) were established in 1852. In 1853 a chair of history was founded and filled by R. Copley Christie, who also taught political economy and jurisprudence. For several years it seemed that the college could not succeed. But in the sixties marked progress was made, and has been maintained ever since. In 1870 the age of entrance was raised to sixteen. In 1872 the Manchester Royal School of Medicine, founded in 1824, in which John Dalton taught chemistry, was incorporated with the college. The requirements had already outgrown the existing accommodations, so a new site was acquired, and new buildings were opened in 1873, and additions have been made continually (Whitworth Engineering Laboratory, 1887 and 1909; Manchester Museum, 1887; Christie Library, 1898; Whitworth Hall, 1902; chemistry laboratories, 1895 and 1905; physical laboratories, 1908; Students' Union and gymnasium, 1909; botanical laboratories, 1911). The chair of organic chemistry, the first of its kind in the country, was founded in 1874, and in the same year the chair in geology, filled by Professor W. Boyd Dawkins, was established. In 1874 a course of lectures was given to women, but they were not admitted to the regular classes. The governors were opposed to mixed classes, and in 1877 refused to sanction their admission. In that year the College of Women was opened in close proximity to the college and was taken over in 1883. Women are now admitted to all classes except engineering. In 1880 the Owens College became the first constituent part of the Victoria University, and was soon joined by University College, Liverpool, and Yorkshire College, Leeds. In 1889 Professor A. W. Ward was appointed principal in succession to Principal J. G. Greenwood (1857–1889), and in the same year the first parliamentary grant was received and scholarships were founded by local authorities. A Day Training Department for Men was opened in 1890, and was followed two years later by a similar department for women. Principal Ward was succeeded in 1897 by Mr., now Sir, Alfred Hopkinson, the present vice-chancellor.

In 1903 Owens College became by charter the Victoria University of Manchester, with power to grant degrees, diplomas, and other distinctions. Local interest was stimulated by this step, and many local authorities make annual grants to the university, while numerous private bequests have recently been made. The aim of the university is so far as possible to meet the requirements and needs of the community. The university was one of the first to grant a degree in commercial subjects. In addition to its reputation in the scientific branches (chemistry, physics, engineering, geology), the university has strong departments in history, English literature, and education, while the medical department, which has always enjoyed a high rank, has been considerably strengthened by the propinquity of the new Royal Infirmary. The university works in conjunction with other institutions in maintaining several departments: music with the Royal Manchester College of Music, technology with the Manchester Municipal School of Technology, and theology with several local theological colleges. Some of the courses at these institutions are recognized for degrees in the university. In the same way the medical department has obtained clinical facilities in many of the local hospitals. The university by its power of inspecting and examining schools plays an important part in promoting and supervising secondary education, and it also has representatives on numerous local education committees. Degrees are granted in the following faculties: arts, science, law, music, commerce, medicine, theology, and technology. The governing body consists of the chancellor (in 1912 Lord Morley), the vice-chancellor, the court, the council, the senate, and the boards of faculties. The university is maintained by income from endowments and invested funds, fees, and grants from the local and central authorities. There is a strong student activity, which centers round the Students' Union, housed in an excellent building opened in 1909, the Students' Representative Council, numerous clubs and societies, and the Athletic Union, for which a large athletic field was acquired in 1901. The enrollment in 1911–12 was 1557 day students. The teaching staff numbers 242 members.

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MANCINUS, DOMINIC. — Writer of the *Liber de quattuor virtutibus et omnibus officiis ad bene beateque vivendum pertinentibus.* (Leipzig, 1505 (35 leaves), also 1512, 1516.) He wrote approved little works in which his fame was far spread. Tritheim in his *Catalogus Scriptorum Ecclesiasticorum* (1493) states that Mancinus, of whom he speaks very highly, was a contemporary. A translation of the work was made into English prose, entitled *The englysche of Mancyne upon the foure cardynal vertues*, published by Pynson (*c.* 1520). This anonymous rendering contains a preface in which the translator shows how the book may be used for double translation. About 1523 Mancinus's book was translated into English verse by Alexander Barclay under the title of *The Mirrour of good Maners* (also published by R. Pynson). In 1568 George Turbevile translated the same book into English verse, with the title *a plaine Path to perfect Virtue.* The object of the Latin verses of Mancinus is to inculcate in the most pleasant form the four cardinal virtues, which he names as Prudence, Justice, Magnanimity, and Temperance. The book was very popular and in use in English schools at any rate till the first half of the seventeenth century, when it was on the list of books of which the Stationers' Company retained the privilege of publishing. Barclay in his Prologue states that the book is to be used to teach " maidens of tender age " as well as boys. Mancinus also wrote in Latin verse another well-known book: *De Passione domini nostri Jesu Christi, c.* 1490. F. W.

MANDEVILLE, BERNARD (1670?–1733). — Author of the *Fable of the Bees, or Private Vices Public Benefits*, which first appeared in 1705 under the title of *The Grumbling Hive or Knaves turned Honest*, a doggerel poem giving an allegorical account of the prosperity of a hive in a reign of vice and its decline under the rule of virtue. The work as well as the later additions made to it (notes, an *Inquiry into the Origin of Moral Virtue, Essays on Charity and Charity Schools, and a Search into the Nature of Society*), because of the satirical and cynical tone caused considerable criticism. Here it is only necessary to refer to Mandeville's interesting arguments against charity schools, arguments which have been levied frequently against the spread of elementary schools. The precept and the example of good parents has much more influence than education. Clothing and educating children relieves the parents from responsibility and pauperizes them. Education does not diminish crime, which is fostered by circumstances rather than vice in nature. Those who establish charity schools are diminutive patriots and interfering meddlers. In any case education is bad for the poor, for it trains them to ease and idleness, and makes them discontented with their lot; " the knowledge of the working poor should be confined within the verge of their occupations." Education " incapacitates them (children of the poor) ever after for downright labor, which is their proper province, and in every civil society a portion they ought not to repine or grumble at, if exacted from them with discretion and humanity." Sir James Fitzstephen Stephen remarks of this essay that it is " perhaps the first specimen of a way of writing about popular education which prevailed down to our own times."

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For Mandeville's philosophy see references given in Baldwin, *Dictionary of Philosophy and Psychology*, Vol. III, Pt. I, p. 363.

MANHATTAN COLLEGE, NEW YORK CITY. — See Christian Brothers, Schools of.

MANIA. — A symptom in a number of diseases, — paresis (*q.v.*), dementia precox (*q.v*), epilepsy (*q.v.*), hysteria (*q.v.*), and senile conditions, — including motor excitation, evidenced usually by speech, and mental excitement; or a disease condition, the excited form of manic-depressive insanity (see Circular Insanity). The disease is manifested by motor unrest or excitement, by emotional exhilaration, by loquaciousness and by apparent ease in thinking. In a mild form the maniacal state is evidenced by a distractibility, viz. a constant flitting of the attention from one thing to another. The flighty character is one supposed to result by exaggeration in maniacal excitements. In the acute form of the disease the excitement is manifested by great activity, motor and mental, by false ideas of power and by exorbitant exhilaration. On account of the prominence of the exaggerated ideas of power the patient is led to perform certain acts which he would not do under normal conditions. The exaggerated feeling of well-being and power leads to ideas of wealth and superiority, and these at times attain an absurd character like those in paresis. The mental exhilaration often leads to the enunciation of words corresponding with the course of ideas, with little or no apparent connection, and in extreme cases there may result an apparent verbal confusion or incoherence similar to that in dementia precox.

Since mania is only one form of manic-depressive insanity, it sometimes alternates with melancholia (*q.v.*), and at times the symptoms are complex, including the principal ones of mania and others usually associated with melancholic states. Thus we find forms of mixed mania, which are called maniacal stupor and unproductive mania. The disease is believed to arise from an hereditary taint, but is curable or recoverable. On the other hand, it is recurrent, attacks appearing throughout the life of the individual at more or less regular intervals. It may alternate with the depressed form of manic-depressive insanity, and result in the circular types (see Circular Insanity).

From the psychological and pedagogical side, this diseased condition is of interest for two reasons. First, it commonly begins in childhood or in the adolescent period, the first attack being of short duration. As a rule, in the later successive attacks the duration is increased. Secondly, the symptoms are considered to be typical exaggerations of the normal reactions of the individual. The early beginning is at times correlated with the stresses of school life, the attacks (although the statistics are meager in this point) beginning more frequently during the second half of the school year. The excitement is considered by some authors, with good reason, to be simply exaggerations of the normal excitability of the individual. It is believed that the child who is normally excitable will, under stress, develop maniacal symptoms, while the usually morose and depressed child will develop the depressive symptoms when he or she becomes abnormal. The curative methods employed are those of rest, etc., and these must be kept in mind by the teacher. S. I. F.

See Insanity.

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MANILA, UNIVERSITY OF SANTO TOMÁS. — See Philippines, Education in.

MANITOBA, EDUCATION IN. — See Canada, Education in.

MANITOBA SCHOOL CASE. — A legal and constitutional case of great importance in the history of the struggle between denominational and public schools. Under § 22, 1, of the Manitoba Act educational affairs were left to the Manitoba Provincial Legislature, provisos being added for the safeguarding of denominational interests, for an appeal in case of dispute to the Governor-General in Council, and finally for control by the Dominion Parliament through remedial laws. From 1871 to 1889 a system of denominational education existed by which Catholics and Protestants maintained their own schools. But as in course of time the character and distribution of the population changed so that there were many denominations entirely unprovided with schools, and as it was felt that a homogeneous educational system was desirable, a law was passed in 1890 establishing a government Department of Education, and Advisory Board with full control over state and rate-aided public schools; books and religious exercises were to be ordained by the Advisory Board; and religious exercises were to be nonsectarian and optional. This law was at once attacked by the Catholics as a violation of their rights and privileges under § 22, 1, of the Manitoba Act. A test case, the Barrett case, was brought to court and carried through to the Judicial Committee of the Privy Council in England in 1893, but the decision was against the Catholics on the ground that no denominational or other schools had existed before the Act. In the meantime a petition was drawn up by the Catholics appealing to the Governor-General to protect their rights and privileges acquired since 1870, and complaining of the injustice of taxing Catholics to maintain what to all intents and purposes were Protestant schools. This appeal became the subject of litigation, and in 1895 the Judicial Committee of the Privy Council in England decided that an appeal lay to the Governor-General in whose jurisdiction it was to make some remedial order. A Remedial Order was issued in 1895 by which Catholics were permitted to maintain their own schools, were to share in any public grant to education, and were to be exempted from supporting any other schools. The province refused to obey the order, and the Dominion government took up the matter, but without taking any decisive action. At the general elections in 1896 the Liberals were returned in a large majority, the separate schools question forming an important part in the struggle. A compromise was put forward by Sir Wilfrid, then Mr., Laurier, Dominion Premier, and Mr. Greenway, Premier of Manitoba, by which a clergyman or authorized religious teacher was to be given access to Catholic schools to give religious instruction, and where the numbers permitted a Catholic teacher might be employed. The Catholics refused to accept any arrangement which did not give them their own school. The Pope was invited to send an Apostolic Delegate to consider the situation, but the Manitoba Government legalized the Laurier-Greenway compromise before he arrived. This law (the Public Schools Act, 1897) is the basis of the present system.

See CANADA, EDUCATION IN.

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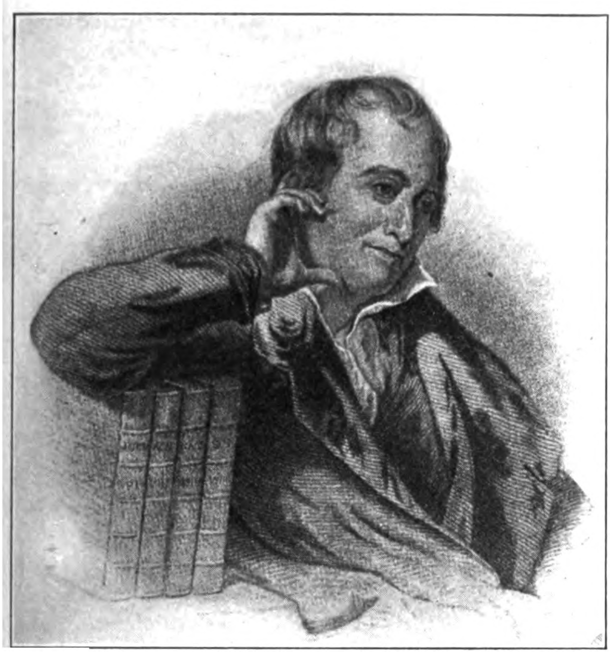
MANITOBA, UNIVERSITY OF, WINNIPEG, MAN. — A provincial university established by the Manitoba legislature in 1877. Six colleges are affiliated with the university. Courses are offered in arts, medicine, engineering, law, pharmacy, and commerce, all but the last leading to their respective degrees. The enrollment in 1910–1911 was 744. The faculty consists of twenty-three members.

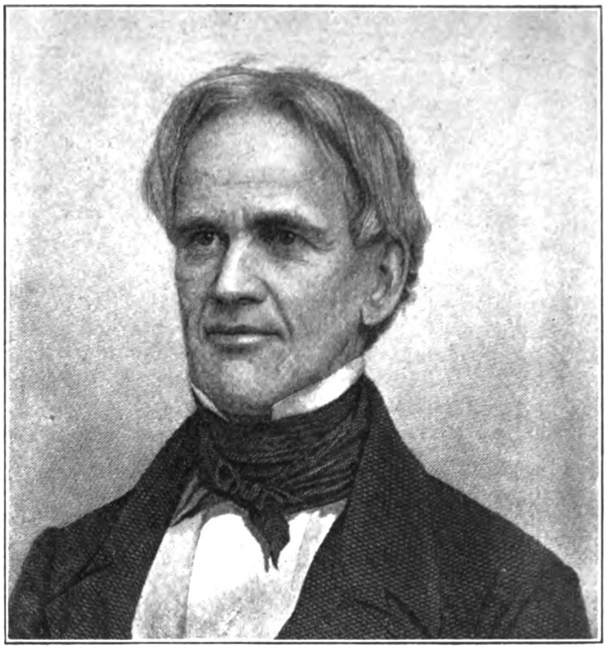
MANN, HORACE (1796–1859). — American educator and statesman. He was born at Franklin, Mass., the 4th of May, 1796, and received the rudiments of his education in the district schools, being prepared for college by an itinerant schoolmaster. He entered Brown University in 1816, and was graduated three years later. He was two years tutor at Brown, when he took up the study of law at Litchfield, Conn. In 1823 he was admitted to the bar of Norfolk County, Mass., and during the next fourteen years he was engaged in the practice of law and in legislative labors. He was for six years a member of the house of representatives of Massachusetts and three years a member of the state senate. In the latter body he was directly responsible for the enactment of four important acts: (1) a law against the use of alcoholic beverages; (2) against the traffic in lottery tickets; (3) the establishment of state hospitals for the insane, and (4) an act creating the State Board of Education.

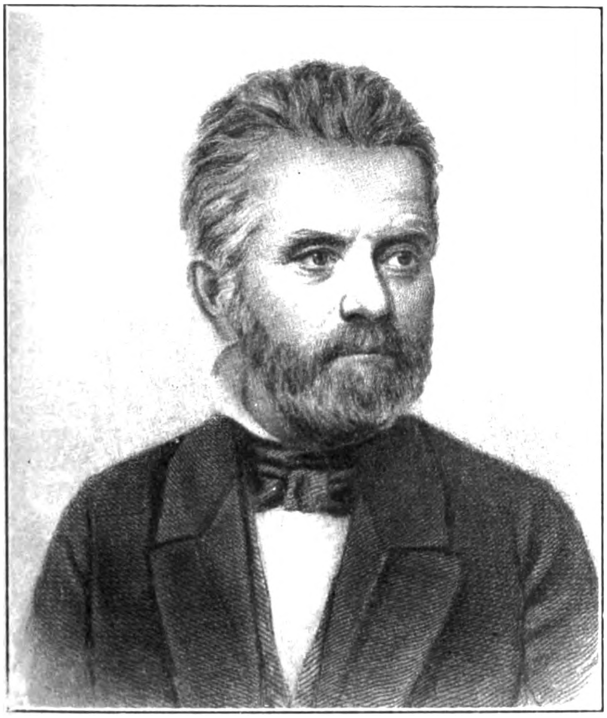
The new board was given power to select a secretary who should have the general oversight of the schools of the commonwealth. It was through the persuasions of his friends Edwin Dwight and Governor Edward Everett (*q.v.*) that Mr. Mann was induced to give up the profession of law and undertake the reorganization of the Massachusetts school system. His task was by no means an easy one. The growth of the district school system and the extension of private schools had greatly weakened the efficiency and influence of the public schools. He entered upon his new duties in June, 1837. He wrote to a friend: "My law books are for sale. My office is to let. The bar is no longer my forum. I have abandoned jurisprudence, and betaken myself to the larger sphere of mind and morals."

As secretary of the State Board of Education, Mr. Mann's first effort was to educate public opinion with reference to the needs and purposes of public education. The lyceum movement (*q.v.*) had made public lectures popular, and he laid under tribute brilliant clergymen, distinguished lawyers, prominent men of letters, and well-known college professors as speakers at the hundreds of public meetings held throughout the commonwealth. Through these public meetings he literally stirred the thoughts and feelings of the entire state, and made possible subsequent legislation which led to the reëstablishment of a common school system in Massachusetts.

His next important reform was the improvement of the teaching force of the state, and this he accomplished by the organization of


William Maclure (1763–1830).
See page 104.


Horace Mann (1796–1859).
See page 118.


Lowell Mason (1792–1872).
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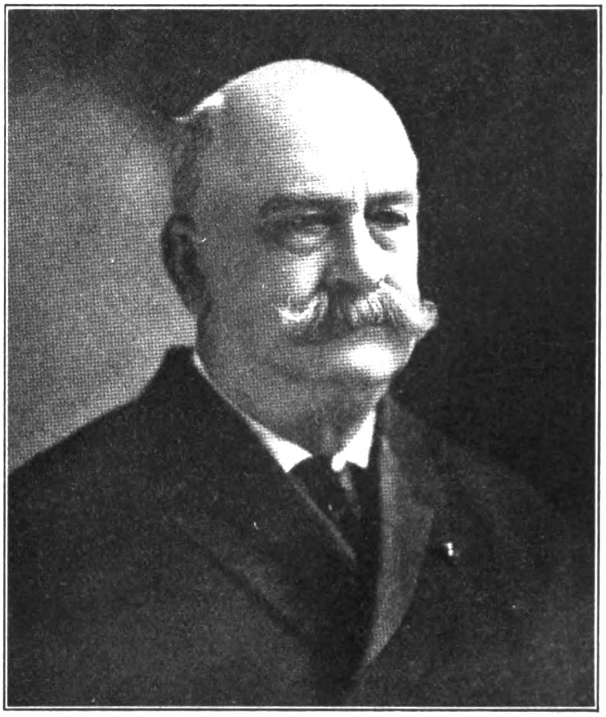
Francis W. Parker (1831–1902).
See page 606.

A Group of American Educators.

teachers' institutes (*q.v.*) and the establishment of state normal schools. For his institutes he secured the best available instructors of subjects taught in the common schools, as well as lecturers on the art of teaching and the professional aspects of education. But he early recognized the need of more extended training for teachers; and through the generosity of his friend Edmund Dwight he was enabled to make the experiment of special schools for this purpose. Two normal schools were accordingly organized — at Lexington (now Framingham) and Barre (now Westfield) — before the end of his second year; and during his third year another school was opened at Bridgewater. Through these normal schools, and similar institutions subsequently organized, Mr. Mann demonstrated to the people of Massachusetts the value of better trained teachers; and the state assumed the entire responsibility of the normal schools.

Another important feature of Mr. Mann's labors was the collection and diffusion of information concerning the actual condition of public education. A law of 1826 had required of the school committees in the different towns of the commonwealth annual statements concerning school attendance, expenditures, etc.; but little use had been made of such returns. In Mr. Mann's hands they became " powerful instruments in educating the public," and they formed the framework of the twelve reports that he issued during the period of his secretaryship of the Massachusetts State Board of Education. These reports were issued as public documents and widely distributed; and more recently Mr. Mann's son has issued an abridged and edited edition of the same in four volumes (Boston, 1891).

The twelve reports on the condition of education in Massachusetts and elsewhere, together with his discussions of the aims, purposes, and means of education, occupy a commanding place in the history of American education. The first report deals with the construction and hygiene of schools — ventilation, heating, seating, and playgrounds — and the physical factors in school life; the duties and responsibilities of school committees; the enforcement of school attendance laws, and the needs of higher standards in the teaching force. The second report is devoted largely to the course of study and to a discussion and criticism of the current methods of teaching reading, spelling, and composition. Mr. Mann was strongly opposed to the alphabetic method (*q.v.*) of teaching reading, and he warmly endorsed the word method. The question of child labor (*q.v.*) and the dangers of employing young children in factories formed an important part of the third report. In the same report he discussed the importance of school libraries and the formation of reading tastes during the school course. The district system (*q.v.*), "entrenched behind statutory rights and immemorial usage," was the burden of the fourth report. Mr. Mann was convinced that " no substantial and general progress could be made so long as the district system existed "; and during his remaining eight years in office he " kept up a continuous fire of argument, entreaty, fact, philosophy, statistics, and testimony." But it required thirty years more to complete the work of reform in this direction.

The fifth report is essentially a pedagogic document. Mr. Mann discusses the teacher, normal schools, pedagogical books, educational journals, school management, corporal punishment, and the relation of the State to education. One of his biographers holds that in his fifth report Mr. Mann reached the climax of his power and success and that it was received at home and abroad in the spirit of highest appreciation (Hubbell). He established in 1838 the *Common School Journal*, ten volumes of which were issued during his secretaryship, and after his retirement William B. Fowle (*q.v.*) became its editor and publisher. The sixth report reverts to the course of study and more particularly to its enrichment, and it contains one of the earliest exhaustive American discussions of the educational value of the study of physiology and hygiene.

In May, 1843, Mr. Mann went to Europe, where he spent five months in the study of educational conditions in Great Britain, Belgium, Holland, France, Germany, and Switzerland. His seventh report embodied the results of his educational tour abroad, and it was the pretext for an attack upon Mr. Mann by the schoolmasters of Boston. His praise of European schools, and particularly his commendation of oral instruction, the word method in teaching reading, and the abolition of corporal punishment in Germany, wounded the sensibilities of the Boston schoolmasters, and a bitter controversy ensued, during which time twenty-five pamphlets were printed attacking and defending Mr. Mann. As Mr. Hinsdale remarks, "The controversy attracted much attention, and made a deep impression on the public mind. It had much to do with fixing Horace Mann's place in educational history. The champion of the new régime had met the champions of the old and overthrown them in the arena of public debate."

In his eighth report Mr. Mann discusses the value of local and county educational associations, the value of vocal music in the elementary schools, and the use of the Bible in schools. It will be recalled that it was through the aid given Lowell Mason (*q.v.*) by Mr. Mann that singing was made a feature of public school work. The ninth report urges the employment of women teachers in the primary schools, the value of teachers' institutes, and the place of moral instruction in public education. The tenth report is a history of the Massachusetts school system. The eleventh report discusses the relation of education and crime, and the twelfth report — prepared after Mann had resigned his secretaryship — reviews the changes in education in Massachusetts during the past twelve years, and discusses the problem of education for defective and dependent children.

In 1848 Mr. Mann was chosen a member of Congress from Massachusetts to succeed John Quincy Adams. He served in this capacity for five years, full of eventful history. In 1853 he became the first president of Antioch College (*q.v.*), which position he filled until his death on Aug. 2, 1859. His educational writings include the twelve reports as secretary of the Board of Education of Massachusetts (Boston, 1838–1849), editorials and articles in the *Common School Journal* (1838–1848), *Lectures on Education* (1848), and numerous papers in Barnard's *American Journal of Education* and the *Proceedings* of the American Institute of Instruction. Extracts from his reports and addresses have been published by his son, George Combe Mann (Boston, 1891, 4 vols.). No American educator has been more widely discussed than Horace Mann. Five different works dealing with his life have been published in the United States, three in France, two in Spanish countries, and one in Italy. W. S. M.

See Massachusetts, State of.

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There is a large and valuable periodical literature of the life and work of Horace Mann. See Barnard's *American Journal of Education*, December, 1858 (Vol. V); *North American Review*, January, 1841, and January, 1845 (Vols. CII and CX); Littell's *Living Age*, May, 1846, and July, 1850 (Vols. X and XXIV); *Edinburgh Review*, July, 1841 (Vol. XXIII); *Princeton Review*, 1886 (Vol. XXXVIII; *Chambers' Journal*, May, 1846 (Vol. V); *Educational Review*, May, 1893, and June and September, 1896 (Vols. V and XII); *Southern Quarterly Review*, January, 1845 (Vol. VII); and *Revue Pédagogique*, December, 1885, and March, 1887 (Vols. X and XII).

MANN, MARY PEABODY (1806–1887). — Wife of Horace Mann; was privately educated. She was associated with her husband in his public school reforms, and with her sister, Elizabeth Palmer Peabody (*q.v.*), in the organization of kindergartens in Boston. She wrote *Life of Horace Mann* (Boston, 1865; republished 1891), and was joint author with Miss Peabody of *Culture of Infancy* (Boston, 1863). W. S. M.

MANNERS AND MORALS, EDUCATION IN. — A term of peculiar significance in Renaissance and post-Renaissance education, when there was formed a combination of chivalric and formal literary education. Then a direct training in manners and formal morality became an essential part of the dominant education. The importance of conduct had been stressed in educational thought and practice from earliest times. Oriental education, in its various types, is largely training in formal conduct, often having little or no relation to moral principles of fundamental importance. With both the Greeks and Romans conduct was the essential product of education, and within the scope of conduct striven for by formal education was much which could be included under manners. During the middle ages a sharp division existed between the literary education of monks and ecclesiastics, and the education in conduct and manners of the nobles and gentry. With the Renaissance these two types were fused, with the result that the gentry aspired to a literary education, which indeed in time came to be the test of gentility, and on the other hand the Church insisted on broadening the scope of morals to include formal manners. Still, while many of the treatises on manners were written by churchmen, most of them found their inspiration in the traditions of chivalry, and the earlier works were direct contributions to chivalric education. (See Chivalric Education; Gentry and Nobles, Education of; Renaissance, Education during the; Social Realism.)

The baronial system developed the plan of education in noblemen's houses (see Chivalric Education), especially in the houses of the Chancellors of the Kings, in whose hands the court patronage lay. In this training the cultivation of manners and morals took a prominent place. The late Dr. Furnivall brought together in the *Babees Book* (Early English Text Society) the following manuals: *The Babees Book or a "Lytyl Reporte" of How Young People should behave*, c. 1475 A.D.; *The A.B.C. of Aristotle*, c. 1430 A.D.; *Urbanitas*, c. 1460 A.D.; the *Lytylle Childrens Lytil Boke*, c. 1480 A.D.; the *Young Children's Book*, c. 1500 A.D.; the *Stans Puer ad Mensam*, attributed to John Lidgate, c. 1460 A.D.; *How the Good Wife taughte her Doughter*, c. 1430; *How the Wise Man taught his Son*, c. 1430. More comprehensive treatises are the following: (1) *The Boke of Nurture, or School of good manners, for men, servants, and children . . . necessary for all youth and children* by Hugh Rhodes of the Kinges Chappell, 1577. (2) *The Boke of Nurture followyng Englondis gise.* By one, John Russell once usher of the chamber and marshal in hall to Humphry Duke of Gloucester. (3) *The Boke of Keruynge*, printed by Wynkyn de Worde, 1513. (4) *The Booke of Demeanor and the Allowance and Disallowance of certain Misdemeanours in Companie* (taken from Richard Weste's *Schoole of Virtue*, 1619). (5) *The Boke of Curtasye, c.* 1430 A.D. Sloane Ms., 1986, Brit. Mus. (6) Bishop Grossetest's *Household Statutes, c.* 1450. (7) *The Schoole of Virtue and booke of good Nourture for children and youth to learne theyr dutie by. Newly Augmented by the author F. S* [eager], 1557. (8) A Series of *Latin Graces.*

Further, Dr. Furnivall enriched his book with a collection of French and Latin poems on Manners and Meals. An Italian series of *Books of Courtesy* was edited by W. M. Rossetti in 1869. The most finished of all these Courtesy books was Baldassare Castiglione's (*q.v.*) *Cortegiano* in 1528. Miss A. T. Drane (*Christian Schools and Scholars,* 1881) gives an account of English Education in the fourteenth century, and quotes the rules for the household drawn up by Elzear de Sabran, in Puy-Michel in Provence, anticipating the training in morals and manners of a household like that of Sir Thomas More at Chelsea. With regard to schools, we have the classical maxim of William of Wykeham in founding Winchester College (1393) that " Manners maketh Man." In the directions issued to the Master of the Henxmen, who had the training of the young gentlemen of the Court of Edward IV, he was required " to shew the schools of urbanitie and nourture of England . . . to have all courtesy in words, deeds and degrees," and diligently to keep them in all rules of precedence, and it was his special business to sit with them in hall, and " have respect to their demeanings." Esquires were appointed to keep the young henxmen (*i.e.* the children sent to the King's court for training) " honest company . . . in talking of Kings and other policies." This talking and telling of tales, though the medieval romance was condemned by writers like Erasmus and Vives, in whose time it had become a source of corruption, was a recognized method of moral culture, in accordance with the idea of the times, *e.g.* one of Caxton's productions was, in 1484, " the translation of Geoffrey de la Tour Landry's *Book of Fayre Ensamples and thensyngementys and techyng of his doughters* originally written in 1371. The stories are composed with the idea of inciting to good conduct, and are taken, some from the Scriptures, some from the lives of Saints, others from popular tales. They show the idea of the moral training of the women in the age.

It is interesting to note here and refer for further details to the article on JEWISH EDUCATION that a large number of Hebrew books of morals appeared in the eleventh, twelfth, and later centuries dealing as much with the manners in general intercourse and table manners as with the conduct of the religious man.

Turning to the Renaissance textbooks of manners and morals, the subject claimed the attention of Juan Luis Vives (*q.v.*) in his *Introductio ad Sapientiam,* his *Satellitium,* and his two epistles *De Ratione Studii puerilis,* all published at Louvain in 1524. *Pietas literata,* a title which has been appropriated as the aim of Sturm, certainly was as marked in Vives. As Sir Richard Moryson, the English translator (1540) of the *Introductio ad Sapientiam* says, the collection of precepts therein contained are calculated to root the love and desire of virtue in the pupil's heart, " extirping from it all manner of vice." It is, in fact, a treatise of Christian morals, for the young pupil, consisting of maxims or aphorisms. The *Satellitium,* which Vives dedicated to Princess Mary, daughter of King Henry VIII and Catherine of Aragon, was to be a " body guard," not like that of the old emperors, against attacks on the body, but his symbolical maxims (some 200 in number) would preserve the princess child, by admonitions, from all vices and faults. In the *De Ratione Studii puerilis,* Vives requires the pupil to learn the *Distichs* of Cato, the *Mimi* of Publilius Syrus, the *Sentences of the Seven Wise Men,* as edited by Erasmus (1513). The child is bidden to take pleasure in stories which teach " the art " of life — such as those of the boy in Aulus Gellius, Joseph in the Holy Books, of Lucretia in Livy, Griselda, and so on. The authors to be read are chiefly medieval Christian poets such as Prudentius. The use of medieval Christian moralist poets was enjoined by Colet's Statutes (1518) for St. Paul's School, and by the Statutes (1583) for St. Bees School. Right on from Chaucer to Vives it should be possible to be said of the pastor and teacher — as Chaucer said of the Clerk of Oxenford, " Souninge in moral virtu was his speche."

Of the many foreign books of moral maxims, a typical one may be named, printed at Lyons in 1576 in French and Italian, entitled *Trésor de Vertu O Tresoro di Vertu,* in which are contained all the noble and excellent sentences and instructions of all the first authors, Hebrew, Greek, and Latin, to lead each one to a good and honorable life.

Wider in circulation than Vives' *Introductio ad Sapientiam* was the *De Civilitate Morum puerilium* (1526) of Erasmus. He states in the Preface that the first element in the instruction of children is the awakening of the child to piety, the second, to learning, the third, to the duties of life, and fourth, to be cultivated from the earliest age, in the rules of civility. It is becoming for a man to control his deportment, his gestures, his clothing, as well as his intelligence. Those who represent the cause of learning must be noble, and ought therefore to show the fruits of courtesy and good breeding. Erasmus proceeds in detail to describe the essential characteristics of good manners and morals in chapters on graceful bearing, clothing, behavior in church, at meals, in meeting others, at games, and on going to bed. Erasmus points out that we cannot choose our fatherland, or our parents, but every one can acquire good qualities and manners. Led by Vives and Erasmus, the Renaissance writers endeavored to win manners and morals, for the young scholar, not away from, but as common ground with, the nobles and gentry. Thus Lawrence Humfrey (*q.v.*) in the *Nobles*, 1560, requires the reading of Erasmus's *De Civilitate* by the young nobles, while in 1568 Dean Nowell's Statutes at Bangor prescribed the same book of Erasmus for the Third Form. There is an instance in 1588 of the Headmaster of the King's School, Canterbury, Anthony Short, being admonished by the Dean and Chapter "to have a greater care and to be more diligent than he hath been, that his scholars may better profit in learning as well as good manners and civility than late they have done."

Erasmus's book was widely circulated abroad, and was translated into English and published in 1532, by Robert Whittyngton, poet laureate, as *A lytil Booke of good maners for children.* In England, however, William Lily's lines on Manners and Morals (*De Moribus*) were read, and ordinarily learned by pupils in the authorized grammar. Manners and morals formed an important element in the Colloquies and in other textbooks, as, *e.g.* in Cootes's *English Schoolmaster*, 1596. In 1633 John Clarke of Lincoln Grammar School wrote his *Dux Grammaticus*, in which is curiously included a treatise on manners, which he regards as an indispensable part of grammar school training, so that the boy shall perform his religious duties, his duty to his fellows and to himself, in the house, at table, to visitors, and to superiors of all kinds. One of the well-known books of the Jesuits was on this subject, viz. *Youths Behaviour, or Decency in Conversation amongst Men. Composed in French . . . now turned into English by Francis Hawkins, Nephew to Sir Thomas Hawkins, translator of Caussin's Holy Court.* 4th ed., 1646. This book is said to have been translated by the child at eight years of age. The original was by La Flèche: *Bienséance de la Conversation entre les hommes, 1595*, and had been translated into Latin, 1617, by Leonard Périn. (See GENTRY AND NOBLES, EDUCATION OF.) Charles Hoole (*q.v.*) recommends the book as well as Erasmus' *De Civilitate*, for he explains that in a school the " sweet and orderly behaviour of children " brings more credit than even sound teaching, "because this speaketh to every one that the child is well taught, even if he learn" but little else.

In addition to the requirement of the teaching of Manners and Morals by the private tutor in the nobleman's family, and in the private as well as in the public grammar schools, the still more important teaching in the ordinary home and household must be borne in mind. In 1537 Richard Whitford wrote *A Worke for Householders* in which the full details are given especially in connection with morals, to be inculcated into the household adult, child, family, and servants, and a treatment is given of lying, oaths, conduct at church, on the Sunday, and of due reverence and respect to parents. Whitford was a Roman Catholic, but the same type of textbook was sanctioned by the Protestant Puritans, *e.g.* by Robert Cleaver and John Dod in 1612, giving full details as to the duties of husbands and wives, parents and children, masters and servants. William Gouge, in his *Of Domesticall Duties*, 3d ed., 1634, takes the highest ground for the inculcation of good manners in the child, viz. that "not only heathen men, but also the Holy Ghost Himself hath prescribed many rules of good manners." Still more interesting is the treatise of Hezekiah Woodward: *A Child's Patrimony laid out upon the Good Culture or Tilling over his Whole Man* (1640), one of the most interesting educational works of the seventeenth century especially from the moral side. The *Gentleman's Calling*, c. 1660, and the *Ladies' Calling* (*c.* 1673), and Clement Ellis's *Gentile Sinner* (1660) abound in the treatment of the training of Manners and Morals, and substantially all the writers on educational theory and practice in the seventeenth and eighteenth centuries deal with the subject. It will be recalled that Daniel Defoe (*q.v.*) wrote a book which had enormous circulation in the eighteenth century, called the *Family Instructor*, continuing the series of manuals for practical treatment of the relations of fathers and children, masters and servants, husbands and wives. Throughout this class of book the Bible is the basis; for a great mass of practical household treatises are founded on the Ten Commandments.

Otherwise the sources from which the manuals for manners and morals were drawn were mainly detached sayings of Solon, Pythagoras, Theognis, Phocylides, Cicero, Cato, Seneca, and of course, Plutarch, Plato, and Aristotle. (Golding made his translation of Seneca's *Beneficia* in 1577.) The permeating influence of Aristotle's *Ethics* joined with the Christian view can be best seen in the noble plan of the *Faerie Queene* of Edmund Spenser (*q.v.*), 1590–1596, which "is disposed into twelve books, fashioning XII. morall virtues," of which he only wrote on six, viz. holiness, temperance, chastity, fidelity, justice, and courtesy. Substantially, the *Faerie Queene* is an educational moral treatise. Nor were suggestions for practical training in manners and morals wanting. In another less known Utopian romance, the *Nova Solyma*, 1648, first translated into English by Walter Begley in 1902, the father in placing his son with the best of tutors says he will not only be made proficient in the liberal arts, but also in the " true moral virtues," and to become a " good man " is the " greatest blessing you can have." The methods of training are described. Pupils are required to practice letter-writing to men of various ranks, to study the best word and gesture in ordinary intercourse, and the most appropriate language for disputing, joking, rebuking, etc. " They have to go through all this in character as on the stage." George Snell in the *Right Teaching of*

Useful Knowledge (1649) suggests that the child should be trained to act the taking of messages courteously, the making of an obeisance, and the *going through* of what is required in their childish duties in preparation for the right performance of the actual duty itself. The religious sanctions for manners and morals in the Sabbath observances, long sermons, catechisings, learning by heart of Scriptures, exercise of parental and pastoral authority, made Puritanic training in morals *practical;* the eighteenth and early nineteenth century moral stories and goody-goody tales were the literary survival of an older, stern, and unceasing discipline in school and home. This aspect of the subject is treated further under LITERATURE, CHILDREN'S; while the modern status of the entire subject is considered under MORAL EDUCATION. F. W.

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MANNHEIM SYSTEM. — See GERMANY, EDUCATION IN.

MANNING, JAMES (1738–1791). — First president of Brown University. He studied at Hopkins Academy, and was graduated from the College of New Jersey (now Princeton) in 1762. After spending a brief period as a traveling evangelist, he opened a Latin school at Warren, R.I., which in 1765 became Brown University. Five years later it was removed to Providence. Manning served as president of the institution until his death in 1791. At the same time he was pastor of the Baptist church in Providence that had been founded by Roger Williams. He was a delegate to the Continental Congress in 1785–1786, and he led the movement which secured the adoption of the constitution by Rhode Island. He was also active in the movement looking toward the establishment of a public school system, and his most important educational publication is *Report in Favor of the Establishment of Free Public Schools in the Town of Providence.* W. S. M.

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MANSFIELD, JARED (1759–1830). — Textbook author. He was graduated from Yale College in 1777, and taught for many years in New Haven and in the Friends' Academy at Philadelphia. He was also instructor in the military academy at West Point (1802–1828). He wrote a series of mathematical textbooks. W. S. M.

MANTUA. — See VITTORINO DA FELTRE.

MANTUANUS, BAPTISTA SPAGNUOLI (1448–1516). — Humanist author of Latin poems which for a time seem to have had a greater vogue than the classical works. His chief work was *Bucolica seu Adolescentia* (1502), of which numerous editions soon appeared abroad and in England. Though styled eclogues, only two of the poems deal with rural life. The work early became a popular school textbook, and editions were issued giving parallel passages from the classics. The eclogues were imitated in English as early as 1514 by Alexander Barclay; they were translated by Turberville in 1567, and imitated again by Spenser in *Shepherd's Calendar* (1587). It was recommended for school use by Colet, and was prescribed by statute in several schools. Spagnuoli is the "good old Mantuan" quoted by Holofernes in Shakespeare's *Love's Labour's Lost,* IV, ii, 95.

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MANUAL ARTS. — See MANUAL TRAINING; also INDUSTRIAL EDUCATION; TECHNICAL EDUCATION.

MANUAL LABOR INSTITUTIONS AND THE MANUAL LABOR SOCIETY. — The movement for the organization of manual labor schools in the United States began about 1825, and drew its inspiration chiefly from the work of Fellenberg (*q.v.*). Such schools were organized in Connecticut in 1819, in Maine in 1821, in Massachusetts in 1824, in New York in 1827, and in New Jersey in 1830. The purpose was to unite training in agricultural and mechanical pursuits with the ordinary school studies. (See AGRICULTURAL EDUCATION.) The Oneida Manual Labor Institute, at Whitesboro, N. Y., was in existence from 1827 to 1834. A part of the day was devoted to work in shops and fields, and the remainder of the day to classroom work in the English branches. George W. Gale (*q.v.*), the director of the institute, aimed to make his institution largely self-supporting through the results of the boys' labors.

The Manual Labor Society for Promoting Manual Labor in Literary Institutions was organized in New York in 1831 for the purpose of "collecting and diffusing information calculated to promote the establishment and prosperity of manual labor schools and seminaries in the United States, and for introducing the system of manual labor into institutions now established without diminishing the standard of literary and scientific attainments." Zachariah Lewis was the first president, and Theodore Frelinghuysen and Jeremiah Day were the vice-presidents. Theodore F. Weld, who had been connected with the Oneida Manual Labor Institute, was engaged as field agent.

The arguments in favor of manual labor schools, as opposed to purely literary institutions, were thus stated by the society: (1) they provide a system of education that is natural; (2) they interest the mind; (3) they have good moral effects; (4) they train in habits of industry, independence of character, and originality; (5) they render prominent all the manlier features of character; (6) they give power for acquiring a knowledge of human nature; (7) they greatly diminish the cost of education; (8) they increase the wealth of the country; and (9) they tend to do away with absurd distinctions in society. The first annual report of the society was published in 1831 (120 pp.). This, however, was the last, for the society soon disbanded on account of lack of interest in the movement and the opposition of existing literary institutions. Thus the manual training movement in the United States was deferred for a half century. (See MANUAL TRAINING.) The society was also active in the matter of gymnastics in schools; and in no small measure the credit for the early recognition of this form of physical training in American schools is due to the Manual Labor Society. (See GYMNASTICS.) W. S. M.

See AGRICULTURAL EDUCATION; FELLENBERG; MANUAL TRAINING.

MANUAL TRAINING. — In spite of many objections, the term "manual training" has come to be generally applied to all forms of constructive handwork when used as an agent in general education. When used in the broadest sense, instruction in domestic art and science, and constructive work in various materials in the lower grades are included. In a narrower conception, the term is restricted to work with mechanical tools given to boys. The tendency in American usuage is to distinguish sharply between manual training as a feature of general education and specialized tool instruction given to selected groups for purely vocational ends.

Place of Manual Training in the various National Systems. — Manual training was first recognized as a valuable feature of school work in European countries. As early as 1858 Otto Cygnæus, who later organized the public schools of Finland (*q.v.*) on a modern basis, outlined a plan of handwork for the primary schools of that country, and in 1866 some form of manual work was made compulsory in all primary schools for boys in country districts as well as in the training colleges for male teachers.

It was Sweden, however, that took the most active part in the early development of manual training. In 1872 the government reached the conclusion that schools for instruction in sloyd were necessary to restore the waning physical and moral health of the nation due to the tendency towards concentration in cities, and the decline of the old home industries. The schools first established dealt with various lines of the old Hus Slöjd occupations, such as carpentry, turning, wood carving, brush making, bookbinding, coopers' and wheelwright work, and exhibited more of an industrial than a cultural plan. This was gradually changed, however, as the movement gained headway, until a well-organized scheme of educational tool work for boys between twelve and fifteen years of age, aimed mainly at the production of domestic utensils, was developed into a recognized school sloyd system. In 1877 the work was introduced into the Folk Schools as a voluntary subject, and government aid was granted in support of the instruction. A sloyd school was established at Nääs in 1872 for teaching boys and young men. Three years later a second school, known as the Sloyd Seminarium, was organized under the direction of Herr Otto Salomon for the training of teachers. This institution has been a very active and stimulating force in the development of manual training in Sweden, and particularly through its summer courses for teachers it has exercised a strong influence upon the thought and practice of other countries. At the present time, sloyd instruction is given in all regular normal schools of the country.

Interest in the principle of manual training developed early in France. In 1873 the Ecole Salicis was established at Paris, in which constructive work in various forms was made an important feature of the curriculum. Manual training was made compulsory in the elementary primary schools of the country by a law in 1882, but the provisions of this law are, even at the present time, only partially realized because of the failure of the communes to provide workshops. Almost from the first, French educators developed a system of instruction for every grade of the elementary schools. Such schemes have been characterized by variety of materials and processes, by their close dependence upon drawing, and by a precise mathematical and rather formal quality. A distinctive feature in the French shopwork of the upper grades is that the theoretical instruction is given by the classroom teacher while the practical instruction is given by artisan teachers. The largest development of manual training in the elementary school is to be found in the city of Paris, where nearly 200 schools are equipped either with woodworking shops or with metal-working shops.

In Germany an active propaganda in manual training has been maintained for many years, but as yet comparatively little has been accomplished towards incorporating manual training into the work of the common schools. A large number of workshops have been established in various parts of the Empire, which are in many cases supported by individuals or societies. Instruction in these shops is in most cases given outside of school hours on an optional basis. In a few cases, as in Munich, the work is given during the regular school day and is obligatory. The ministries of several of the German states make annual contributions in aid of manual instruction, but the work still depends to a considerable extent upon private or corporate support. Manual work for girls in the form of needlework, on the other hand, has for a long time been compulsory in the common schools of Germany. Work in cookery for the older girls is now appearing in a number of places. Courses in paper, cardboard, and pasteboard, as well as in wood and metal, are features of the German scheme of manual work, and the making of simple apparatus for scientific instruction is common. The Manual Training Seminary at Leipzig, founded in 1887 by the Association for Manual Training for Boys, under the leadership of Dr. Waldemar Goetze, is the active center of the movement in Germany. This seminary is the main institution for the training of teachers, and a large proportion of those teaching shopwork in Germany have attended its summer courses.

In England the development of manual training dates from about 1887, when centers of shopwork were established in the London schools. The Board of Education for England and Wales awards special grants for manual training instruction given to boys and girls at least eleven years old. Teachers are required to possess certificates either of the City and Guilds of London Institute or of the Educational Handwork Association. Teachers' certificates issued by the former body are accepted as a qualification for teaching shopwork by the Board of Education of England and Wales, by the Scottish Education Department, and by the Department of Agricultural and Technical Instruction for Ireland. In the years 1892–1911 the institute granted certificates to 5240 teachers of woodwork and to 501 teachers of metal work. English manual training in the elementary schools is generally a reflection either of the Swedish sloyd or an exercise and project system developed by teachers who have received practical training in the trades. At the present time, manual training is represented as a compulsory feature in the schools of almost all the large cities of England. In London in 1910 there were 240 centers at which instruction was afforded to some 60,000 boys.

In the United States, manual training came into being partly as the expression of a new educational philosophy and partly from dissatisfaction on the part of the public with the results of the purely bookish curriculum of the schools. The first appearance of constructive work for clearly definite cultural purposes appears to have been in connection with the classes of the Workingmen's School founded in 1878 by the Ethical Culture Society of New York. This institution comprised a kindergarten and elementary school in which manual work from the first formed a vital and important part of the educational program. It was, however, in the secondary school that manual training first gained serious attention in American education. In 1880, through the efforts of Dr. Calvin A. Woodward, the St. Louis Manual Training School was opened in connection with Washington University. This school was a completely equipped high school, giving instructon in various lines of shopwork and in mechanical drafting, as well as in the regular secondary school subjects, with exception of the classics. The work of this school attracted wide attention, and the success with which mechanic arts instruction had been incorporated in the curriculum led to the rapid organization of similar schools in other large cities. In Chicago, Toledo, Cleveland, and Cincinnati privately supported schools were organized from 1884 to 1886, and public manual training schools were established in Baltimore in 1884, Philadelphia 1885, and Omaha 1886. The first provision for girls' work in these schools was made in the case of the Toledo Manual Training School, and included sewing, dressmaking, millinery, and cooking. The shopwork instruction given in these institutions comprised joinery, turning, pattern-making, forging, and machine work, and sometimes foundry practice and tinsmithing. The character of this work has been very similar in different schools, and until late years has been almost uniformly based upon the principles of the "Russian System," so called because the ideas involved first gained recognition in the United States through the exhibit of the Imperial Technical School of St. Petersburg at the Centennial Exhibition in 1876. The central idea of this system of shopwork instruction which was developed in a technical school for the instruction of engineers, is the analysis of a craft into its fundamental processes and typical constructions, and the presentation of these elements in an orderly and sequential scheme as separate exercises.

The rapid development of this type of secondary school, which has continued steadily since its inception, has resulted in an institution peculiarly American. In other countries the introduction and spread of manual training has been confined to the elementary school, and no institution exists in Europe of a purely educational character that represents any parallel to the comprehensive and costly equipment of these schools, nor, it should be said, to their rather vague and indefinite educational status. Established with the double purpose of affording a more liberal and realistic training for boys of secondary school age, and of developing capacities for industrial careers, the records show that apart from the large number that go forward into engineering schools, only a trivial percentage of graduates from manual training high schools enter directly into industrial work, and that this small number go almost wholly into the " white shirt " occupations of draftsman or administrative assistant. Of late years a tendency has become apparent to intensify the industrial side of the curriculum in such schools, and to transform them into technical schools with a definite vocational basis. (See INDUSTRIAL EDUCATION.)

It was not until between the years 1887 and 1890 that manual training reached the public elementary school. Experimental classes in carpentry, the expense of which was borne by Mrs. Quincy A. Shaw, were conducted at the Dwight School in Boston in 1882. These were taken under the care of the city and transferred to temporary quarters in the English High School building in 1884, but the work was not given a place in the course of study until 1888. In Springfield, Mass., sewing was introduced in the schools in 1884, and in 1886 a manual training school was established, at which pupils coming voluntarily from the elementary schools were given instruction in knifework. In 1885 the Legislature of New Jersey passed a law providing that the state would duplicate any amount between $500, and $5000 raised by a city or town for instruction in manual training. This led to the early introduction of the work in a number of places in various parts of the state, first of all in Montclair. In New York City the Industrial Education Association was established in 1886 for the purpose of providing instruction in manual training for boys and girls in voluntary classes, and two years later was organized as a college for the training of instructors to undertake the task of supplying teachers for the new field. In 1888 the city of New York began the introduction in the public schools of a manual training course of study, including drawing, sewing, cooking, and woodwork.

Content of Course — The early work in manual training in the elementary school was almost uniformly limited to the two or three upper grades, and consisted of shopwork for boys and sewing and cooking for girls. From these grades handwork slowly made its way downward, and at the present time such work, dealing with a variety of materials, is given in all grades in many of the larger cities. The report of the Commissioner of Education for 1910 states that in more than seven hundred cities of the United States, public schools have manual training in several years of the course, generally in the elementary grades, but frequently in all the years from kindergarten through the high school.

Educational Value. Underlying Theory. — In the early agitation for the introduction of manual training in the eighties, the claims put forward for the new subject as evidenced in the discussions of the National Education Association, and particularly in the meeting of the Department of Superintendence in 1888, were in the main based on the conception of formal discipline. Manual training was entitled to a place in the school because it exercised the observation, trained the reasoning powers, and strengthened the will. Although it is doubtless true that public support of the new movement was due to a vague but sincere conviction that the introduction of handwork stood for industrial training, educators as a rule most carefully refrained from advancing a claim for utilitarian value in the work, and all utterances were for the most part expressed strictly in terms of the prevailing faculty psychology.

The early practice of manual training in the elementary school was experimental and formal. The type exercise was the universal form in which handwork appeared, and it was not until the influence emanating from the Sloyd School of Boston (established in 1888) began to be felt that toolwork for boys assumed a more invigorating form. The fundamental principle of sloyd, which places emphasis on the value of working for a useful end, and so enlisting the interest of the worker, soon found acceptance in the general practice in the elementary school, and to a certain extent modified the methods of the manual training high school.

About this same period, the doctrine of formal discipline began to lose its place as the cornerstone of manual training philosophy. By the beginning of the present century the conviction had developed that constructive work comes into natural relations with the worker only when he contributes something of his own thought to attain the end placed before him. Out of this attitude, aided by a deeper study of the thought of such educational leaders as Froebel, Pestalozzi, and Herbart, and clarified by the emphasis of the psychologists on the unity of the mental processes, has developed the conception of manual training as a means of expression, a means of expression in terms of form, color, materials, muscular activity, and concrete ends, a means of expression peculiarly adapted to child life.

During the last seven or eight years, the growing emphasis placed upon the social meaning of education has caused attention to be turned more and more to the subject matter or content side of manual training, and the conception of manual training, at least in the elementary school, has come more and more to be that of an educational instrument interpreting the fields of art and industry in terms adapted to child life and the limitations of the school.

All of this development in the philosophy of manual training has tended away from the employment of self-contained, formal courses towards the use of handwork as a medium of social experiences leading to the acquisition of knowledge. One of the most complete expressions of this idea is the employment of constructive activities in the lower grades in the form of social occupations, which serve as centers for instruction in other branches. This type of work was developed to a notable extent in the University Elementary School conducted by Professor John Dewey from 1896 to 1905 in connection with the University of Chicago.

Vocational Education and Manual Training. — With the attention given to industrial education in the United States of late years, manual training has undoubtedly lost something of its importance in the public mind. It is probable, however, that this attitude is only temporary, for all thoughtful consideration agrees that manual training in elementary schools constitutes an invaluable basis, and, under the peculiarly unsettling influences of American life, a most necessary foundation for an effective system of industrial education. On the other hand, it seems probable, from many experiments now being conducted, that a semi-vocational or a pre-vocational type of manual training is likely to assume importance in large cities, which will afford to boys and girls compelled to leave school at the compulsory age limit, an elective opportunity for one or two years before that time to acquire some measure of industrial intelligence and to learn from a number of industrial experiences the general field for which they may be best fitted. C. R.

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MANUAL TRAINING, HYGIENE OF. — Manual training when given under proper conditions is an occupation distinctly favorable to health. It is important, however, that certain hygienic rules should be observed. First of all are certain obvious matters. The room should be large, well lighted, and well ventilated; or, better still, when conditions permit, the work should be out of doors. There should be suitable benches, ample in size, and adjusted in height to the pupil's work. Cleanliness in the room, the work, and the pupils should be rigorously demanded. The pupils should not work for long periods without change and recreation. Fine and delicate work, like certain forms of woodcarving, where there is a confusion of lines, should be omitted, at least in the earlier grades. As a rule exercises should be chosen which can be done standing, and the pupils should be taught to take a correct posture. Frequent change of position is desirable. Exercises which permit many movements of the body are preferable to those that require only a few; and exercises which especially hinder the circulation and retard breathing should be avoided. The muscles on both sides of the body should be exercised. Pupils should be taught not to press the tools against the body. Dust, poisonous colors, and the like, should be avoided.

Woodwork at the carpenter's bench is one of the most healthful kinds of manual exercise. It permits many movements, different postures of the body, and fosters all-round development. The lighter forms of woodwork are especially good for younger children. Woodcarving has its disadvantages on account of the fine work often required and the tendency to a bad posture. Scroll work is unhygienic, because the position of the body is likely to be bad, fine sawdust is often inhaled, and the strain on the eye is considerable. Tooled leather work, cut leather work, and the like, are also in many respects bad.

In all forms of manual training the hygiene of the eye should be considered. There should always be sufficient light, at least ten-meter candles at each desk on the darkest days, and the work so arranged that no pupils will face the source of light. The hours for work may well be in the early afternoon. In the case of the finer work, especially for girls, the instruction should be omitted in dull weather when the light is insufficient.

Manual work for girls deserves special consideration from the hygienic point of view. The work must not be too fine and difficult, it should be kept at a proper distance from the eyes, and a proper posture should be maintained. The rules given by Cohn and Weber may be taken as norms. "I have classified hand-occupations," says Cohn, "in four divisions, according as the degree of fineness of the meshes and stitches lets the work be seen with greater or less difficulty, or not at all, at a distance of one foot. All those coarse kinds of work in which the meshes and stitches can be clearly distinguished at arm's length by a healthy eye are not injurious. Such are knitting, crocheting with wool, netting, coarse darning, and ordinary making of garments. The second kind of work has to do with meshes and stitches which a healthy eye can only see with a great effort at a distance of one foot and at an angle of one minute. To this class belong fine darning, appliquè of muslin on net for curtains, embroidery in colors, the old German Holbein embroidery (so called), mignardise crochet, and the favorite filet-guipure. The third class includes fine white needlework, English and French embroidery, button-holing, satin-stitch, and marking. This kind of work, by its greater minuteness, leads very frequently to myopia or asthenopia. The fourth class, that of superlatively fine needlework — point lace, petit-points, fine pearl embroidery, and genuine lace work — is absolutely injurious. There is, moreover, a special reason for avoiding satin-stitch in schools; namely, that this work is stretched on a frame, which cannot be brought near the eye like the other kinds of work, but the eye has to be brought near to it."

In some of the occupations for girls care should be taken to avoid strain of vision on account of the colors used. Black on black or white on white cause strain because of lack of contrast. On fine work the pupils should work for but a short period, ten minutes or so continuously, and then the eye should be relieved by a short pause and exercises in looking at objects at a distance. According to Cohn manual work should never be done by artificial light unless it be the electric light. Children with serious eye defects should be excluded from the work.

In regard to the question when manual training should begin, the answer is that it may be begun at an early age provided it is of the right kind. Kindergarten children, for example, can use a hammer in driving a nail, and it forms a healthful exercise; but they should not attempt the finer and more complex occupations like fine weaving and sewing.

Certain general principles apply to manual training and to all forms of motor training. The exercises at first should involve the large muscles, and those requiring finer and more complex coördinations should come later. The work should be given in right sequence, that in the earlier years being propædeutic to what comes at a later period. And it is important from the point of view of hygiene as well as pedagogy that there should be individualization, adaptation to the physiological and psychological age, or the stage of development, and an appeal to the interests of children. Manual training is often especially valuable for those children who are in some way defective. Not only are the defects likely to be discovered in the manual work, but this often furnishes a wholesome form of activity that is prophylactic against disease. Psychiatrists often use various forms of manual work, especially agriculture, as a means of cure in nervous breakdown; such exercises are perhaps equally important for the prevention of nervous disease.

The deeper meaning of manual training, as of all forms of motor training, is not without importance for hygiene. It is only by exercise of the peripheral organs that proper stimulation is furnished for the development of the brain. Even consciousness itself is apparently conditioned by stimulation from the peripheral sense organs. It is noteworthy that the nervous system is developed in the embryo from the epiblast, the outside germ layer, not from the meso-blast, and then it is folded in. Thus, genetically, the nervous system is developed by contact with the external world, and its later and higher developments are dependent upon peripheral stimulation. The importance of this is shown in large letters in the training of defectives, as in the classic case of Seguin's boy, where an idiotic hand, incapable of coördinated movements and control, by systematic exercises beginning with the larger muscles of the shoulder and arm, was educated in a year or two so that it could execute such highly coordinated acts as catching a ball, buttoning a coat, and the like.

Thus the brain and the nervous system are conditioned in their development by motor exercise, and manual training represents in an important way a group of habits that are among the alphabets of health. Again, the habits of attention, accuracy, self-reliance, and self-control that are fostered by manual training are of vital significance in mental hygiene. And, finally, manual training furnishes opportunity for the development of normal reactions toward others, emphasizing important social relations; and this work is allied with the positive, creative, productive, and coöperative activities that are of vital significance in social hygiene. W. H. B.

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MANUALS, TEACHERS'. — The term "manual" originally meant an abridgment of a subject. It was so used by the Greeks. (*Enchiridion*); and this use of the term is rather general to-day. In France, since the period of the Revolution, and in our own country, since about 1830, the term has had special educational significance, in that it has been made to cover only such helps as were of special value to teachers in the development of subjects of study. Such manuals, however, were prepared as early as the time of Comenius (*q.v.*). During the six years (1642–1648) that he was in the service of the Swedish government, the great Moravian educator prepared a large number of manuals on ancient and modern languages, morals, science, and the arts for the use of Swedish schoolmasters. Soon after the French Revolution, manuals as helps to teachers in moral and physical sciences were published in France. The great educational movement of the first quarter of the nineteenth century in the United States gave birth to numerous teachers' manuals. The earliest American manuals, dating from the year 1830, pertain to subjects not previously taught in the schools, such as physiology, music, and calisthenics. Somewhat later the introduction of drawing in the schools led to the publication of numerous manuals on art instruction. With the spread of the Oswego movement (*q.v.*), a demand was created for manuals on common objects. The Grube method, the phonetic method, and scores of other specific methods of giving instruction in definite branches of study have likewise contributed to the literature of teachers' manuals in the United States. *The Instructor's Manual,* published by Samuel R. Hall, in 1852, covers the entire field of education. Many of the recent teachers' manuals have aimed to give definite suggestions for carrying out the course of study. Such is the aim of the three volumes published by James MacAllister in Philadelphia in 1887 (*Manuals of the Graded Course of Instruction in the Philadelphia Public Schools*). More recently the term has been used to cover the helps prepared by authors of textbooks in the use of their particular books, as Zuchtmann's *Teachers' Manual of the American Music System* (1893) and Frye's *Teachers' Manual of Geography.* W. S. M.

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MANY-SIDED INTEREST. — In the article on Interest (*q.v.*) it is noted that the term "interest" is used in an objective sense to denote the typically important concerns of life — science, politics, religion, art, etc. Herbart defined the aim of education as the development of many-sided interest — that is, of regard for all of these significant human values. The term "interest" obviously designates the active and alert identification of the self with these concerns; the term "many-sided" denotes the need of non-one-sided susceptibility. The notion was the counterpart, from the realistic side, of the current idealistic conception of complete and harmonious development of all the individual's powers or faculties as the aim of education. J. D.

MAP or MAPES, WALTER (fl. 1200). — English ecclesiastic, author, and satirist. He was born on the border of Wales, probably in Herefordshire, of a noble family. He studied at Paris between 1150 and 1160 for he mentions Girard la Pucelle as one of his teachers. By 1162 he was back at the English court, where he acted as secretary and itinerant justice. He traveled frequently with and on behalf of the King, Henry II, and attended the Lateran Council. In 1176 he became canon of St. Paul's and precentor of Lincoln. After 1196, when he was archdeacon of Oxford, nothing more is heard of him. Map was for long definitely known as the author of *De Nugis Curialium,* a gossiping and witty account of the life of the times as seen by a member of the court.

A number of poems attributed to Bishop Golias indicating the excesses and licentiousness of monks and ecclesiastics are now thought to have been written by Map. In addition to many shorter poems, the most famous in this series are the *Apocalypse of Golias* and the *Confession of Golias.* From the latter of these are drawn, not from the same context, the lines of the famous drinking song: —

> Meum est propositum in taberna mori:
> Vinum sit appositum morientis ori,
> Ut dicant cum venerint angelorum chori
> "Deus sit propitius huic potatori."

While there are certain difficulties in the way of accepting Map as the author of all Goliardic poems and of the large number of Arthurian legends (*Lancelot of the Lake,* the *Quest of the Holy Grail,* and the *Death of Arthur*) attributed to him,. all that can be said is that his name has been attached to them by long tradition. The poems and the *De Nugis* afford valuable first-hand evidence of the life and thought of the time from one who by his position and experience was able to draw an entertaining picture.

See Goliards, and references there given.

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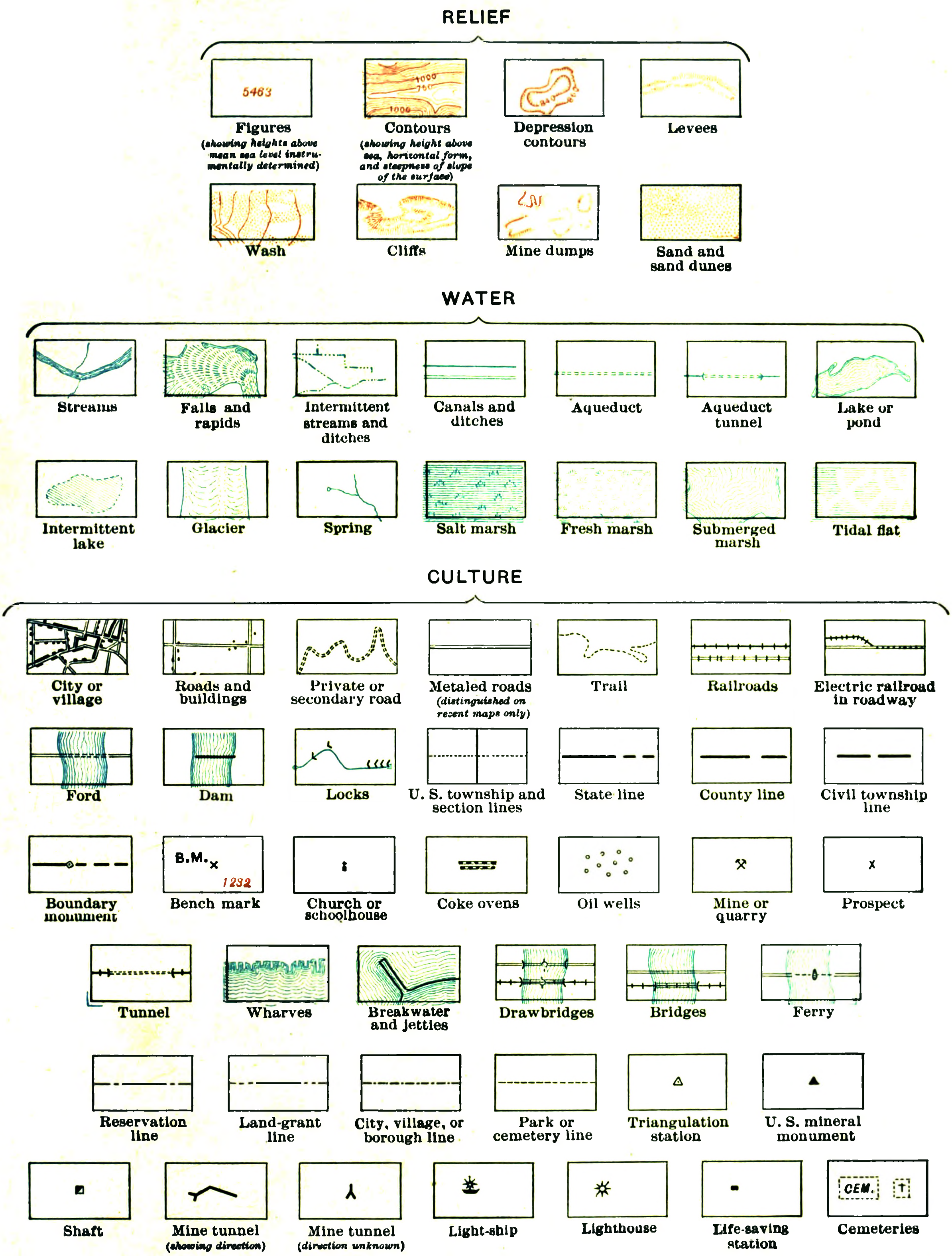
MAPS, CHARTS, GLOBES, AND ATLASES. — Of the several means which have been devised to represent the surface of the earth and indicate the form, size, and distribution of geographic features, as well as the geographic distribution of a wide range of facts and phenomena, the map and chart are best known and most generally used. The distinction between map and chart based on common English usage is that the representation on a reduced scale and a flat surface of the whole or a part of the earth's surface is a *map,* while the representation under similar conditions of the facts and phenomena relating to the sea is a *chart.* As the surface of the earth is nearly spherical, a sphere or a section of a sphere furnishes a much more accurate ground for the construction of maps than a flat surface, but the difficulty of handling and housing large *globes* greatly limits their use. A globe three feet in diameter is very unusual, the majority being eighteen inches or less. When maps of different parts of the earth's surface are gathered together in a single volume, it is called an *atlas.* As the maps must be printed on pages of the same size, and as the areas represented differ greatly in size, they are necessarily drawn to different scales. The common type of atlas is one in which the maps are for the greater part political in character. Other types of atlases will be mentioned later.

Maps. — The use of maps among civilized people is almost universal. Every schoolboy who has studied his geography knows something about them, and travelers, students, and the general public turn to them instinctively when in need of certain kinds of information. They are of such value in engineering and commerce and in such general use for scientific, military, political, and educational purposes that it is rather remarkable that they are so little understood or appreciated. They make use of a symbolism which in late years has developed to the proportions of a language. To the trained explorer, engineer, and navigator this language is as easily read as a printed page and conveys even more exact ideas. For the majority of users, however, maps are consulted because they show approximately the form of natural and political divisions, furnish a means of tracing routes of exploration, travel, and trade, and show the location of places in reference to each other. The layman usually lacks the ability to read maps and knows nothing of the great variety of facts shown or of the scientific accuracy of their presentation.

Classification of Maps. — A classification of maps may be made according to (1) the area represented, (2) the facts shown, (3) the scale employed, and (4) the purpose for which they are to be used. In area represented, distinction is generally made between (a) the earth as a whole, shown on a "world map," which pictures the entire surface of the earth in a single map; or on a "hemisphere map," which shows the surface in two hemispheres; and (b) parts of the earth, as shown on a "general map" for a continent or large political division, or a "map sheet" of a topographic or similar survey.

Facts Shown. — Classified according to the facts shown, there are: (1) *Political maps,* which show primarily the location of settlements and the division of continents into countries, and countries into smaller political and administrative divisions. The map base upon which such facts are represented generally shows certain physical facts as well, especially the natural boundaries and the chief drainage lines. (2) *Physical maps,* which may show the physical features and conditions of a given region in detail, or the distribution over the whole or a part of the earth of certain physical facts or phenomena such as the average rainfall or the location of the ocean currents. (3) *Industrial and Commercial maps,* which show such facts as the distribution of population according to density, the distribution of industries in which the people are engaged, the location of important commercial and trade routes, the position of commercial and industrial cities, and trunk lines of communication. (4) *Geological maps,* constructed to show the rock formation underlying the surface covering of the earth, the geologic age to which they belong, or their economic importance. (5) *Ethnological maps,* to show the distribution of people according to race, religion, color, speech, or custom. (6) *Historical Maps,* in great variety, used to show the conditions as they were in some part of the world at some previous time in the world's history, or used in a series to show how conditions have changed


RELIEF
5463
Figures (showing heights above mean sea level instrumentally determined)
1000
750
1000
Contours (showing height above sea, horizontal form, and steepness of slope of the surface)
840
Depression contours
Levees
Wash
Cliffs
Mine dumps
Sand and sand dunes
WATER
Streams
Falls and rapids
Intermittent streams and ditches
Canals and ditches
Aqueduct
Aqueduct tunnel
Lake or pond
Intermittent lake
Glacier
Spring
Salt marsh
Fresh marsh
Submerged marsh
Tidal flat
CULTURE
City or village
Roads and buildings
Private or secondary road
Metaled roads (distinguished on recent maps only)
Trail
Railroads
Electric railroad in roadway
Ford
Dam
Locks
U. S. township and section lines
State line
County line
Civil township line
Boundary monument
B.M.
1232
Bench mark
Church or schoolhouse
Coke ovens
Oil wells
Mine or quarry
Prospect
Tunnel
Wharves
Breakwater and jetties
Drawbridges
Bridges
Ferry
Reservation line
Land-grant line
City, village, or borough line
Park or cemetery line
Triangulation station
U. S. mineral monument
Shaft
Mine tunnel (showing direction)
Mine tunnel (direction unknown)
Light-ship
Lighthouse
Life-saving station
CEM.
Cemeteries

Symbols used on the Topographic Map of the United States now being issued by the United States Geological Survey. Relief features are shown in brown, drainage features in blue, and culture in black.

or developed from time to time during the lapse of years.

Scale. — In considering the classification of maps according to scale, it must be borne in mind that, based upon the system of linear measurement in use, a decimal system may be adopted, as among the French and German map makers, or a more arbitrary scale such as is frequently used by British and American map makers. Under this classification, there are: —

(1) Maps on a scale from 1: 500 to 1: 10,000, usually referred to as plain or detail maps. Included in this group are the maps prepared by engineers having in charge the construction of canals, railways, systems of irrigation, and the plans of cities and villages. Most objects may be shown in their correct form and true to scale.

(2) Maps on a scale from 1: 10,000 to 1: 150,000. The most important maps in this group are the topographic maps which are now being made, or which have already been made by practically all of the great governments of the world. These maps are necessarily drawn and printed in sheets of convenient size for handling, the number of sheets running into hundreds for small countries and thousands for large countries. In the European countries especially they are regarded as of the utmost importance for the war departments, and for that reason in many countries their execution has been intrusted to such a department. In other countries, special bureaus or departments are maintained for the work. These maps have also been found of importance to agriculture and commerce, in works of internal improvement, for recording geological researches or the classification of soils, and in many other ways. On them it is usually possible to show many objects true to scale, although others, such as rivers, and roads, are necessarily very much exaggerated.

The sheets of the topographic map of the United States are published in three scales: (1) 1: 62,500, which is approximately one mile to one inch, used for densely settled and industrially important parts of the country. (2) An intermediate scale of 1: 125,000 used for the greater part of the country. (3) 1 : 250,000, or about four miles to one inch used for the desert regions of the west. The sheets on the largest scale show an area of fifteen minutes of longitude by fifteen minutes of latitude; the intermediate scale thirty minutes by thirty minutes, and the smallest scale one degree by one degree. The execution of the work is by the Geological Survey of the Department of the Interior. The topographic map of the United Kingdom on a scale of one inch to a mile was completed in 1890, and consists of 697 sheets (488 of the new series). It is published (a) in outline with contours in black, (b) with vertical hachures in brown or black, and (c) in five colors. The topographic map of the German Empire is on a scale of 1: 100,000. It was completed in 1909 in 674 sheets. The sheets issued since 1901 have been printed in color.

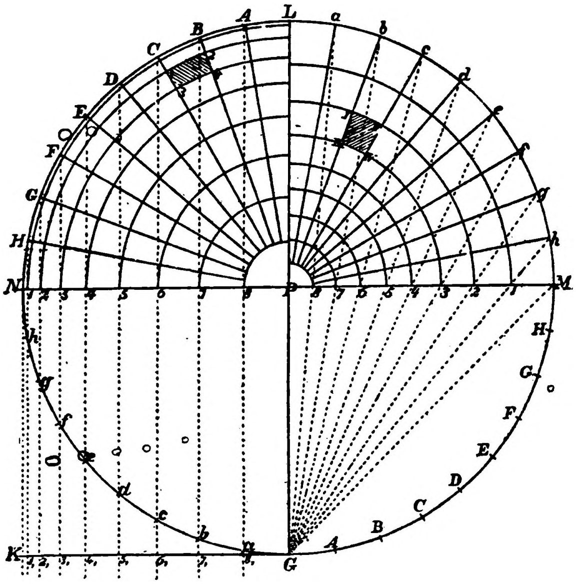
There are several excellent topographic maps of France in existence, one on a scale of 1: 80,000, another on a scale of 1: 1,000,000, and a third on a scale of 1: 200,000; the last two are based on the first. Still another is in preparation on a scale of 1: 50,000. Each sheet is bounded by parallels and meridians, and their relief is shown in contours of ten-meter intervals printed in brown.

(3) Maps on a scale from 1: 15,000 to 1: 1,000,000 and smaller. These include the general maps of continents and countries and their larger divisions. In maps drawn on these smaller scales it is impossible to show all geographic features or to show even the selected ones in their correct form. The first difficulty is avoided through the careful selection of facts to be shown, and the second by the use of symbols.

Use.— In any classification according to use, the school map must be distinguished from all others. Whether in the form of a wall, text, or atlas map, it includes but few details and is usually designed to furnish clear and definite information concerning features and places discussed in the school textbooks.

Collecting the Data. — Before the preparation of a map can be undertaken, it is necessary to assemble the facts which are to be shown when it is completed. First of all, it is necessary to know the position, form, and dimensions of all the objects which are to be represented. The position of a point on the earth's surface is usually stated in terms of its latitude and longitude. Its latitude is its distance north or south of the equator, — the equator being the zero of latitude, — and its longitude is its distance east or west of a selected prime or zero meridian. There is, therefore, a north or south latitude and an east and west longitude. Each circle is divided into 360 degrees, each degree into sixty minutes, and each minute into sixty seconds. The poles of the earth are in latitude ninety degrees, while the meridian, halfway around the earth, from the prime meridian, is both 180 degrees east and 180 degrees west longitude. The division of the circle into 360 degrees was introduced among the Greeks chiefly by Hipparchus (about 180–125 B.C.), and to him also has been given the credit of originating the idea of fixing the position of places on the earth by means of their latitude and longitude. As the position of certain points on the earth's surface has been determined by astronomical means with great exactness, the position of other points and objects are usually determined with reference to these. It is quite as important, although less customary, to indicate the third element of position, viz. the height of a place above, or its depth below, an ideal plane of reference, called sea level. This is usually mean tidal height as determined at some selected station from a series of observations extending over a long period of time.

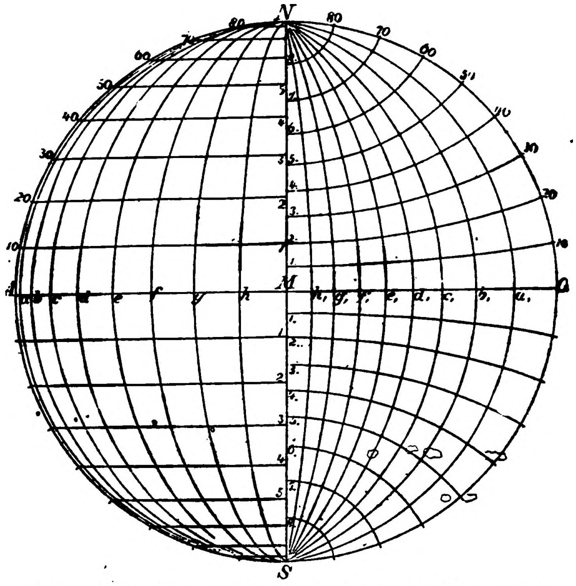
Projections. — When the necessary data has been collected, the map is drawn. As already pointed out, this can be done with the greatest accuracy on the surface of a sphere. The equator, poles and prime meridian are first located, and the surface of the sphere is then covered with a network of parallels and meridians. By means of this net, the outlines of continents and islands, the boundaries of states and nations, and the form and position of geographic features may be correctly shown. A representation of any part of the earth's surface must therefore, if kept true to scale, be developed upon a sphere or a part of a sphere. In practice, however, this is utterly impossible. The uses to which maps are put make it necessary that they should be on some flat surface, such as paper or cloth, in order that they may be rolled, folded, or bound together, and carried about easily.



Orthographic Polar. Stereographic Polar.

FIG. A. — The left-hand half of the above figure shows the orthographic polar projection. The half circle is divided into ten-degree arcs, *LA–AB–BC* and *Ga–ab–bc–* etc. As the eye in the projection is assumed to be at an infinite distance, these points are projected upon the line *PN* at the points numbered 8, 7, 6, 5, etc., by parallel lines drawn at right angles to *PN*. The parallels are drawn as concentric circles passing through the points thus determined, and the meridians are drawn as straight lines from the circumference to the pole at ten-degree intervals. The right-hand half of the figure shows the stereographic polar projection. The half circle is again divided into ten-degree arcs. The eye is assumed to be at *G*. Points *a, b, c, d,* etc., are projected upon line *PM* at 8, 7, 6, 5, etc. The parallels are drawn as concentric circles passing through these points and the meridians as straight lines from the circumference to the pole and at ten-degree intervals. The two shaded spots 1 2 3 4 and *I II III IV* represent the projection of exactly the same part of a sphere and show how and where this part would appear in the two projections.

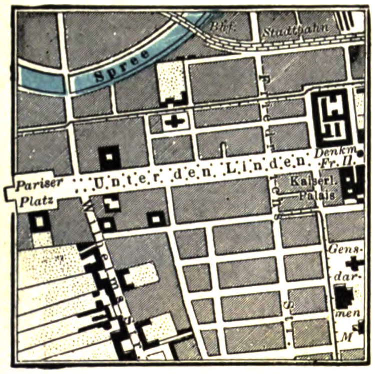
The network of parallels and meridians is, however, as necessary for the flat map as it is for the globe. It is of course possible to make use of a perfectly arbitrary net, such as is made by equally spaced lines crossing each other at right angles. Maps constructed on this projection are known as *plain* maps (or charts) and were originated by Marinus of Tyre, who lived about 100 A.D. He is regarded as the founder of mathematical geography. Many forms of projection have been devised, as mathematicians and astronomers have, since ancient times, sought to make the unavoidable errors as small as possible, and to devise forms of projection adapted for special uses. Five forms of projection, or modifications of them, are in very common use. These are the *orthographic* the *stereographic*, the *globular*, the *conical*, and *Mercator's*. Briefly, the characteristics of these projections are: (1) *Orthographic.* In this projection the circles of the sphere are supposed to be seen by an eye placed at an infinite distance and projected upon a plane which passes through the center of the sphere and perpendicular to the line of sight. The meridians and parallels are crowded toward the outer edge of the map. (2) *Stereographic.* By this



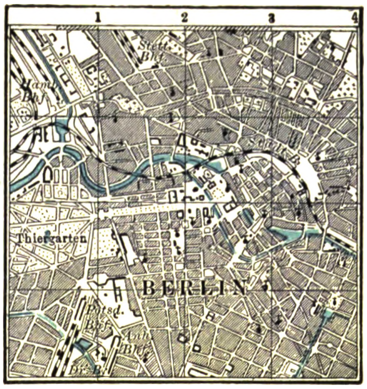
Orthographic Equatorial. Stereographic Equatorial.

FIG. B.— The left-hand half of this figure shows the orthographic equatorial projection. The crowding of parallels and meridians toward the outer edge is characteristic of this projection. After the distance between the parallels has been determined (as shown in Fig. A) they are drawn as straight lines, as the eye is at an infinite distance and on a level with all planes. The spaces between the meridians on the equator are determined in the same way, and the meridians are frequently drawn as the arcs of circles, although other methods of drawing them are also in use.

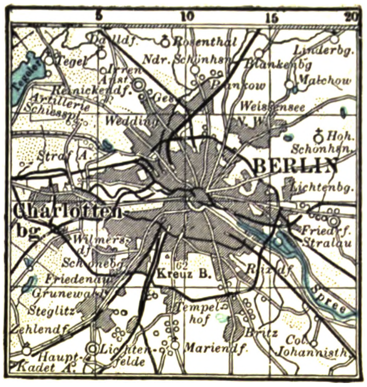
The right-hand half of the figure shows the stereographic equatorial projection. In this the meridians and parallels are crowded near the center.


Spree
Bhf.
Stadtbahn
Pariser Platz
Unter den Linden
Denkm. Fr. II.
Kaiserl. Palais
Gens-dar-men M.

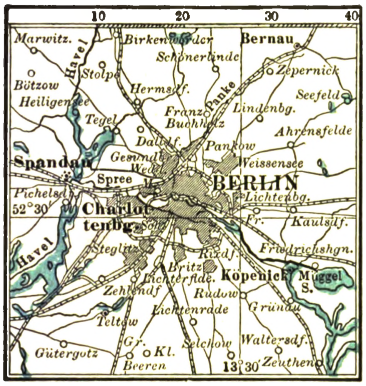
Area 1 square kilometer.
Scale 1 : 25,000.


1
2
3
4
Stett. Bhf.
Thiergarten
BERLIN
Potsd.
Anh. Bhf.

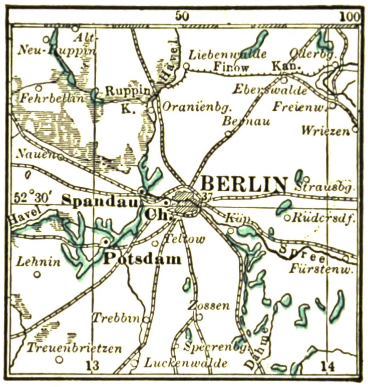
Area 16 square kilometers.
Scale 1 : 100,000.


5
10
15
20
Tegel
Rosenthal
Ndr. Schönhsn.
Blankenbg.
Linderbg.
Reinickendf.
Pankow
Malchow
Weissensee
Wedding
BERLIN
Charlottenbg.
Lichtenbg.
Friedrf.
Stralau
Wilmersd.
Schöneberg
Friedenau
Grunewald
Kreuz B.
Steglitz
Tempelhof
Zehlendf.
Britz
Spree
Lichterfelde
Mariendf.
Johannisth.

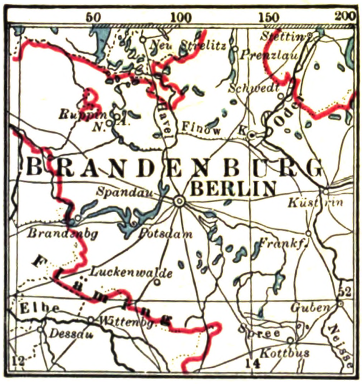
Area 400 square kilometers.
Scale 1 : 500,000.


10
20
30
40
Marwitz
Birkenwerder
Bernau
Schönerlinde
Zepernick
Bötzow
Stolpe
Hermsdf.
Seefeld
Heiligensee
Tegel
Franz. Buchholz
Lindenbg.
Ahrensfelde
Dalldf.
Pankow
Spandau
Weissensee
Spree
BERLIN
Pichelsd.
52°30'
Charlottenbg.
Lichtenbg.
Kaulsdf.
Havel
Steglitz
Friedrichshgn.
Britz
Lichterflde.
Köpenick
Müggel S.
Zehlendf.
Rudow
Teltow
Lichtenrade
Grünau
Gütergotz
Gr. Kl. Beeren
Selchow
Waltersdf.
13°30'
Zeuthen

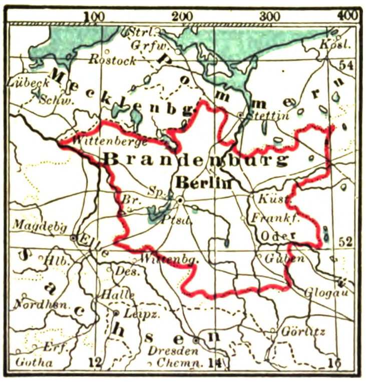
Area 1600 square kilometers.
Scale 1 : 1,000,000.


50
100
Neu-Ruppin
Liebenwalde
Oderbg.
Finow
Kan.
Fehrbellin
Ruppin K.
Oranienbg.
Eberswalde
Bernau
Freienw.
Wriezen
Nauen
BERLIN
52°30'
Spandau
Ch.
Strausbg.
Havel
Rüdersdf.
Teltow
Lehnin
Potsdam
Spree
Fürstenw.
Zossen
Trebbin
Treuenbrietzen
Sperenbg.
Luckenwalde
13
14

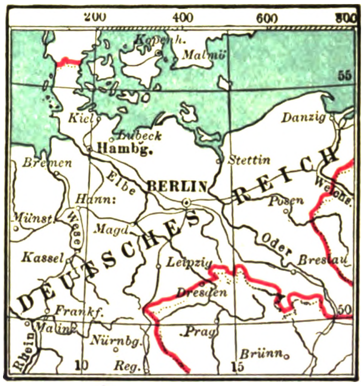
Area 10,000 square kilometers.
Scale 1 : 2,500,000.


50
100
150
200
Neu Strelitz
Stettin
Prenzlau
Schwedt
Ruppin
Finow
Oder
BRANDENBURG
Spandau
BERLIN
Küstrin
Brandenbg
Potsdam
Frankf.
Luckenwalde
52
Elbe
Wittenbg.
Guben
Dessau
Spree
Kottbus
Neisse
12
14

Area 40,000 square kilometers.
Scale 1 : 5,000,000.


100
200
300
400
Strl.
Grfw.
Köslin
Rostock
Pommern
54
Lübeck
Schw.
Mecklenbg.
Stettin
Wittenberge
Brandenburg
Berlin
Br.
Küst.
Magdebg.
Frankf.
Oder
52
Sachsen
Wittenbg.
Guben
Halle
Leipz.
Glogau
Nordhsn.
Erf.
Görlitz
Gotha
Dresden
Chemn.
12
14
16

Area 160,000 square kilometers.
Scale 1 : 10,000,000.


200
400
600
800
Kopenh.
Malmö
55
Kiel
Lübeck
Danzig
Hambg.
Bremen
Stettin
Elbe
BERLIN
Hann.
Posen
Weser
Münst.
Magd.
Oder
Kassel
Leipzig
Breslau
DEUTSCHES REICH
Dresden
Frankf.
50
Rhein
Main
Nürnbg.
Prag
Brünn
10
Reg.
15

Area 640,000 square kilometers.
Scale 1 : 20,000,000.

Small maps of Berlin and vicinity on various scales as indicated. The areas represented vary from 1 square kilometer to 640,000 square kilometers. These maps show the generalization necessary when the scale of a map is reduced.

method the center of projection is in the surface of the sphere, while the projection is made upon a plane at a right angle to the diameter which passes through the center of the projection. In this projection the meridians and parallels are crowded toward the center of the map. (3) *Globular.* A form of projection in which the surface of a hemisphere is projected upon a plane which is parallel to the base of the hemisphere. The center of projection is in the axis produced beyond the surface of the other hemisphere, a distance equal to one half the chord of a ninety-degree arc. This projection was designed to overcome the crowding of the parallels and meridians shown in the orthographic near the edge, and in the stereographic near the center. As a result, the parallels and meridians are about equally spaced, and the map is often arbitrarily drawn in that way. (4) *Conical.* In this projection the surface of the sphere is projected upon the surface of a cone tangent to the sphere. The point of sight is at the center of the sphere. (5) *Mercator's.* This form of projection shows the meridians as parallel to each other, and the parallels as straight lines crossing the meridians at right angles. It has many variations but in the best the meridians and parallels are so spaced that, at all places, the degrees of latitude and longitude have the same ratio to each other as on the sphere.

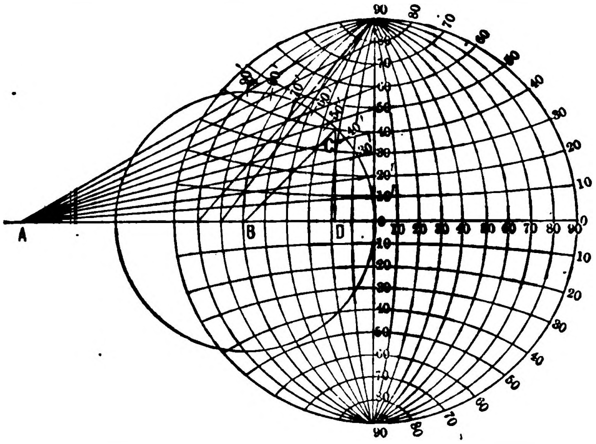


FIG. C. — The globular equatorial projection shown above is developed from the smaller circle whose center is at *B* on the line 90–90 drawn tangent to the smaller circle at 0. This tangent line becomes the polar diameter of the larger circle, and to determine the 10-degree intervals on this diameter the following method is used: The equatorial diameter of the smaller circle is prolonged beyond its circumference to *A*, a distance equal to the line *CD*, which is one half the chord of a 90° arc. From *A* through 90′–80′–70′–etc., marking off 10-degree intervals on the circumference of the smaller circle, lines are drawn which intersect the polar diameter of the larger circle at 90–80–70–etc. These measurements are then transferred to the equatorial diameter, and in this way three points are located for each parallel and meridian. As both parallels and meridians are arcs of circles, it only remains to find the centers of these circles by the usual methods and to complete the projection. The 10-degree intervals found by this method are approximately equal, and the projection is often constructed arbitrarily and called the arbitrary projection.

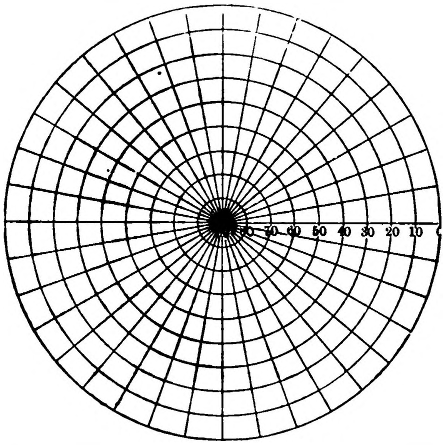


FIG. D. — This shows the globular polar projection. The 10-degree intervals are determined as for Fig. C above. The parallels are concentric circles, and the meridians are drawn as straight lines from the circumference to the pole.

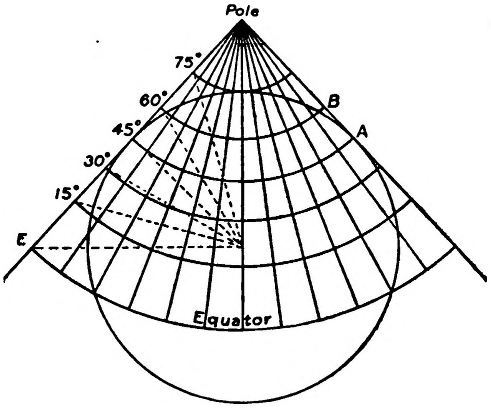


FIG. E. — In this diagram the forty-fifth parallel has been selected as the center of the area to be mapped, and the cone is tangent to the surface of the sphere at that parallel. The position of the other parallels being determined, they are drawn as concentric circles with the pole as a center. The meridians are straight lines radiating from the pole and at equal distances on any parallel.

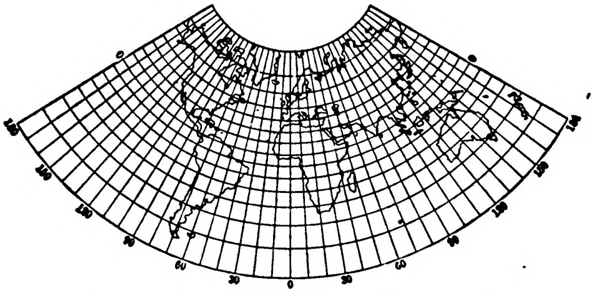


FIG. F. — Conic Projection of the World.

Filling In. — After the net of parallels and meridians has been drawn, it is a comparatively easy matter to fill in the outlines of countries, including the coast line, rivers, roads, and railroads, and to indicate the positions of cities and villages. In the nature of things maps will often fail to show all the facts of nature. No map can show all of the irregularities of a coast line or all the windings of a river, and the smaller the scale of the map, the more these and other facts must be generalized. On some coasts tidal changes affect the position of the actual coast line, from hour to hour, and the best that can be done is to show on large-scale maps the extent of land alternately covered and exposed. On the smaller scale maps even the dots and other symbols used to indicate the position of cities cover much too great an area, as do also the lines for the rivers and the roads.

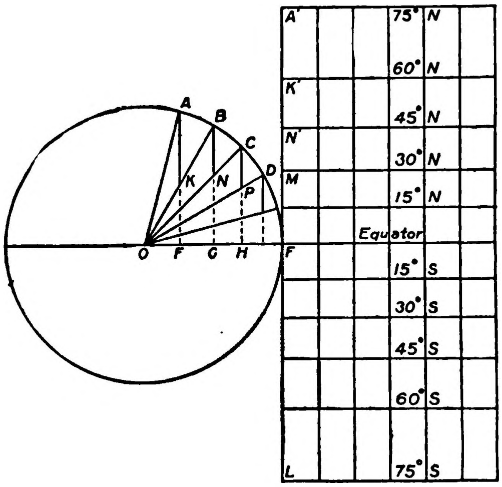


FIG. G. — In this modified form of Mercator's projection the distances between the parallels which are here drawn at fifteen-degree intervals are determined by dropping a line perpendicular to *OF* and parallel to *A'L* from the end of each radius to the next radius. $AK = A'K'$, $BN = K'N'$, $CP = N'M'$, etc. The meridians are parallel and equidistant, their distance apart being the same as that between the equator and the first parallel.

Methods of showing Relief. — It was not until toward the close of the eighteenth century that scientific methods were developed for showing accurately the surface features of the earth. Up to that time, map makers had been content to indicate the position and general direction of the large or important elevations by means of molehills and serrated ridges, which gave little idea as to their extent and none as to their form and the steepness of their slopes. Two methods are now in general use which may be said to satisfy scientific requirements. One of these is by the use of contours, and the other is by the use of hachures. In the contour maps each contour passes through points at the same distance above sea level. If the area to be mapped includes a bit of seacoast, the coast line itself may be taken as the first contour and the zero of elevation. The remaining contours will then be drawn at such intervals as to show clearly the character of the relief. A contour which is ten feet above sea level is drawn where the coast line would be if the land was depressed by that amount. Whatever the interval chosen, the contours are farther apart on gentle than on steep slopes, although crowded contours drawn at an interval of ten feet may indicate a much gentler slope than more widely spaced contours drawn at much greater intervals. Contours are used on the topographic sheets now being issued by the Geological Survey of the United States government. The way in which contours show relief is well brought out in the ideal sketch and corresponding contour map (Fig. I) which is used by the Survey to explain their meaning. Contours were first used in 1728 by M. S. Cruquius in his chart of the Merwede.

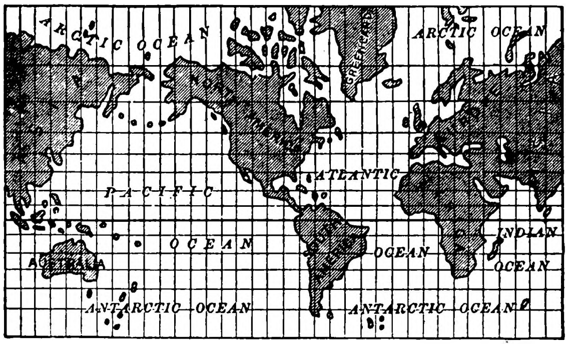


FIG. H. — Mercator's Projection.

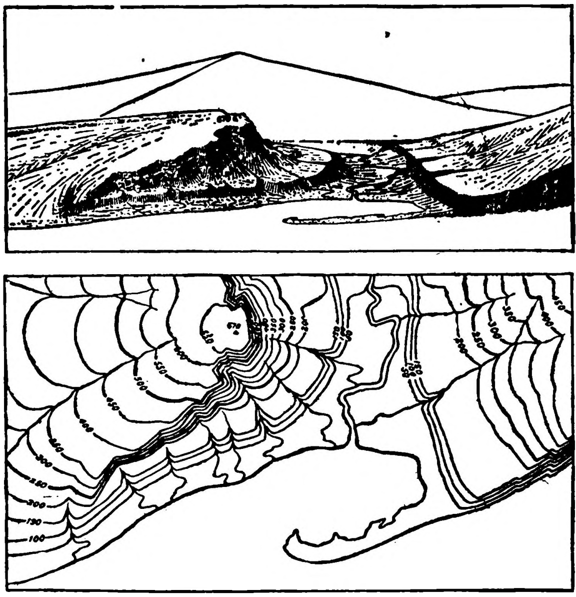


FIG. I. — The sketch shows a river valley with terraces and a high hill and steep cliffs. The map shows how these features are expressed by the use of contours.

While contoured maps show the height of the land and furnish sufficient data to determine in a general way the steepness of mountain slopes, they fail to show the modeling of the earth's surface as clearly as do hachures. This method makes use of lines which vary in thickness and in distance apart according to the steepness of the slope represented. They are drawn in the direction which would be taken by flowing water, and when contour lines are used on the same map, they cross the contours at right angles. The method was first given scientific form by Major J. G. Lehmann, although proposed at a somewhat earlier date by Ludwig Müller. The scheme as outlined by Lehmann assumed vertical illumination and a consequent variation in the amount of shade from nothing for a horizontal surface, to absolute darkness for a vertical surface. He suggested, however, that its use be limited to regions in which the slopes did not exceed forty-five degrees, assuming that steeper slopes would be, in a military sense, practically impassable. This resulted in white for horizontal surfaces, black for slopes of forty-five degrees, and for intermediate slopes at five-degree intervals, a proportion of white and black determined by the formula W : B = (45 − n) : n in which n represents the slope for which the proportion is sought. If the slope is twenty degrees, the proportion will work out

$$W : B = (45 - 20) : 20 = 25 : 20 = 5 : 4.$$

The full scale is shown in Fig. J, with the proportion of black and white indicated for each interval. The system has had very wide application, and changes have been made from time to time in various countries, either for the purposes of securing greater clearness, as in the Müffling system, which uses dotted and wavy lines and alternating thick and thin lines for this purpose, or to provide for steeper slopes, as in the Austrian system, which reserves solid black for slopes of eighty degrees. In large general maps upon which contours are drawn at considerable and frequently irregular intervals, the strata are usually shown by several colors or by tints and shades of one color. In the map of the world on a scale of 1 : 1,000,000 proposed by Professor Penck and now under construction by several governments the colors to be used are blue for the sea, green for lowlands to 300 meters, yellow between 300 and 500 meters, and reddish tints for greater elevations. The use of the mezzotint shading instead of the line shading is sometimes resorted to, and in contour maps the results are often excellent. Maps shaded upon the assumption of an obliquely lighted surface are often very artistic in appearance, but they lose in scientific accuracy.

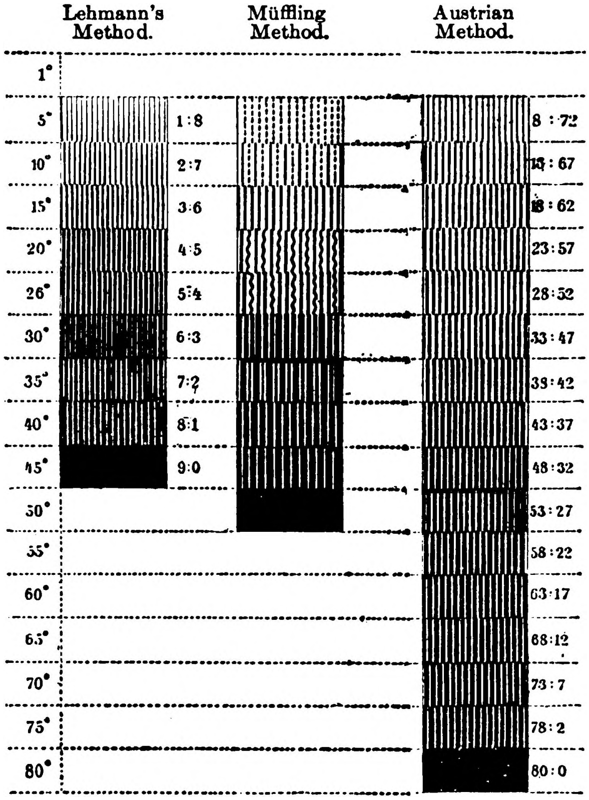


Fig. J. — This figure shows the three hachure systems described in the text. The Austrian method represents the highest development of this method of showing relief.

All maps employ some symbols, and the details shown in the topographic surveys have led to the use of a very considerable number. The facts shown on the topographic sheets of the United States may be divided into three classes: (1) relief, printed in brown; (2) drainage, printed in blue; and (3) culture, printed in black. The full-page illustration shows the symbols used on these maps.

In the placing of names on a map there is no uniformity of practice, but in the matter of orthography uniformity is being rapidly introduced through governmental and other boards on the spelling of geographical names.

Relief Maps. — Many attempts have been made to make relief maps, chiefly for school use. It has been urged with reason that by their use the children may be given more accurate notions concerning the surface of the earth and the effect of relief upon climate, the distribution of life, the location of settlements, and the development of routes of trade and communication. The best relief maps are those which are constructed on a large enough scale to permit the showing of elevation true to scale. This cannot be done, however, on small-scale maps. In these the heights are greatly exaggerated, the slopes absurdly steep, and the generalization of the surface features very considerable, but even these when properly constructed are undoubtedly valuable, although it may be questioned whether children gain much of value when they attempt to make crude maps of this sort out of sand, clay, putty, papier-mâché, etc.

Printing. — After the map has been drawn, it still remains to be printed. In the early days this was done from wood blocks or from copper plates on which the map had been engraved. Wood engraving for maps was abandoned many years ago, but copper engraving, especially when combined with etching, is still in use. Other quicker and cheaper processes have been discovered such as lithography, zincography, algraphy, and heliography, and these give very satisfactory results.

Charts. — The surface of the earth measures approximately 196,940,000 square miles, of which 145,054,000, or nearly three fourths, is sea. Over much of this vast surface ships carry goods and passengers. Some of them are tramps, trading from port to port as contracts offer, but for the most part they follow well-defined routes and enter and leave their regular ports at stated intervals. It is of the greatest importance that they should be able to do this without undue danger or delay, and, to make this possible, every maritime nation has made or is making extensive and accurate surveys of its coasts and harbors. In some instances, notably in the case of Great Britain, colonial interests have led nations to extend their surveys to the coasts and harbors of other countries whose governments are less able to undertake them or less interested in so doing. In spite of all that has been done, there are long stretches of coast and large ocean areas which have never been accurately surveyed and charted.

Charts are essentially maps for the use of navigators. As such they must include depth curves and characteristic soundings, show the nature of the bottom, and indicate the position of buoys, lighthouses, and other aids to navigation, as well as the position of the coast line at high and low water. Currents are shown by arrows and described in notes, as is also the range of tides. On the large-scale charts channel lines and ranges are given, and life-saving stations, ports showing storm warnings and time balls, are indicated. Forbidden anchorages are also shown. Most charts show enough of the coast to indicate its character and mark clearly every prominent feature or fact of interest to the navigator, especially if it may serve him as a landmark.

Collecting the Data. — As in the construction of a map, so with the chart, the first step is the collection of the data to be shown on the completed chart. The position of the area to be charted is obtained by astronomical observations and by reference to points whose positions have already been determined and a net of parallels and meridians is then drawn. Such topographical features as are deemed important are next located. These always include high and low water lines, offshore rocks, lighthouses, and streams of all sizes, and usually include many other features of importance. The survey of the sea bottom is especially important, as it is only by this means that sunken rocks, reefs, shoals, sand bars, and other dangers may be located. This work is done by sounding. The soundings are made in a series of lines, from a boat whose position is accurately determined at short intervals, over the entire area to be charted. In shallow water the soundings may be taken by hand by casting the lead overboard and noting the depth indicated when the lead reaches the bottom and the line is vertical. For greater depths machines are used. At best this method of determining the configuration of the sea bottom is unsatisfactory, as there exists no means of ascertaining depths between soundings. Near the shore and in harbors and about their entrances soundings are therefore close together. After all of the soundings have been compiled, the characteristic ones are selected and plotted on the original sheet, the depth curves are drawn, and shoals, bars, anchorages, and channel depths located. In harbors in which sediment is being constantly deposited and wherever the sand bars are being shifted by the action of waves and ocean currents, new soundings must be frequently taken and the charts corrected. The constant increase in the size of vessels making use of harbors make frequent surveys necessary. Usually, however, surveys are made only at considerable intervals, but changes and corrections are being made constantly as new dangers are discovered and as changes are made in buoys and lights.

Scale. — Harbor and channel charts are published on scales varying from 1: 5000 to 1: 60,000, coast charts on a scale of 1: 80,000, general coast charts on a scale of 1: 400,000, and general sailing charts on a scale of 1: 1,200,000.

Projections. — The Mercator projection is used for nearly all general sailing charts. Its characteristics have already been briefly stated. The three other projections chiefly used in the construction of charts are the polyconic, gnomonic, and globular. The polyconic is similar to the conic already described, except that instead of a single tangent cone several are used, each parallel being the base of a right cone which is tangent to the sphere along that parallel. The radii increase in length as the distance from the pole increases, and the parallels are therefore not the arcs of concentric circles and are not strictly parallel. The division of each parallel into degrees of longitude is correct, and the meridians are therefore more and more curved as the distance from the central meridian increases. The latitude scale is correct on the central meridian only. In the gnomonic projection the eye is at the center of the earth, and the projection is upon a plane tangent to the earth's surface. The globular projection has already been described.

Globes. — The advantages and disadvantages of maps and charts drawn on the surface of a sphere have already been pointed out. They are of the utmost importance in geographical instruction, as it is only by their use that children gain correct ideas as to the form, size, and position of the great land and water bodies and their chief divisions.

The Manufacture of Globes. — In the manufacture of globes a core or matrix is first covered with many layers of paper pasted together; this covering is then cut apart, the core removed, and the two hemispheres at once joined together along the line of the equator. The sphere is then mounted on an axis and coated with whiting, which is smoothed and allowed to harden. The paper gores upon which the map has already been printed are then mounted with the greatest care so as to adapt them to the surface of the sphere. The number of gores used varies from twelve to twenty-four. Nearly all globes are mounted upon standards in such a way that the axis is inclined approximately 23½ degrees out of the perpendicular.

Atlases. — The practice of showing the geographical distribution of all sorts of facts and phenomena has become very common in recent years and has resulted in the publication of many special atlases of which the following are characteristic: (1) atlas of geology; (2) atlas of hydrography; (3) atlas of meteorology; (4) atlas of commerce and statistics; (5) atlas of plant distribution; (6) colonial atlas; (7) school atlases of various sorts; (8) and historical atlases. In each type special methods and symbols have been developed in order to show the facts as clearly, accurately, and completely as possible.

For the place of the subject in the study of geography and the general question of teaching method, see Geography, Teaching of, and the references there given. C. T. Mc. F.

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MARBLE, ALBERT PRESCOTT (1836–1906). — School superintendent. He was educated at Bowdoin College and Colby University, graduating at the latter institution in 1861. He taught in the public schools of Maine and Wisconsin; was principal of the Worcester Academy (1866–1868); superintendent of schools at Worcester (1868–1894) and at Omaha (1894–1896); and from 1896 until his death he was assistant superintendent of schools in New York City. He was active in the councils of the National Education Association and the Massachusetts Teachers' Association. His publications include *Sanitary Condition of School Houses* and numerous articles in educational journals. W. S. M.

MARBURG, ROYAL PRUSSIAN UNIVERSITY OF, GERMANY. — The first Protestant University in Germany, established in 1527 by Philip of Hesse as a center for the propagation and support of Lutheranism. A Pädagogium or preparatory school was established at the same time. Imperial recognition was not obtained until 1541, but degrees were granted before that date, the privilege being granted by a local ruler for the first time. Among the early humanistic teachers were Buschius, Eobanus Hessus, and Schuppius. The university was well attended, and in 1600 there were about 1000 students. The introduction of Calvinism in 1608 by the Landgrave Maurice drove many teachers and students away, and for them the Landgrave of Hesse-Darmstadt founded the University of Giessen (*q.v.*). The two universities were combined in 1625 at Marburg, but only for a few years. The Thirty Years' War almost led to the extinction of the university, which was recreated in 1753 as the University of Hesse-Cassel. It was for a long time strongly denominational under the Reformed Church, an exception being made only for Christian Wolf (1723–1740). This attitude tended to disappear during the period of Enlightenment, and even the theological faculty admitted Lutherans by 1821. The university, however, at no time during this period attained great standing; the medical-scientific faculty was weakened by the development of the Collegium Carolinum at Cassel, transferred to Marburg in 1786. A few chairs were added at the end of the eighteenth century, but the endowment was still small until under the Kingdom of Westphalia (1806–1813) the funds of the institutions at Rinteln and Helmstedt were transferred to Marburg. In the middle of the last century the university suffered largely through political complications, and progress was so slow that for a time a proposal was in the air to amalgamate again with Giessen. The union of Hesse with Prussia in 1866 marked the beginning of a new era in the history of the university. The government treated the institution generously. The development of new chairs, seminars, institutes, and equipment has been very rapid. Special emphasis has been laid on the provision of facilities for the study of modern languages and philology. A strong summer school is maintained and is well attended by foreign students. The following faculties are maintained: theology, law, medicine, philosophy (philosophy, history, and natural science sections). The enrollment in the summer semesten of 1912 was 2014 students.

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MARCEL, CLAUDE (1793–1876). — Educationist and French consul at Cork. From 1825 to 1865 he lived away from France, and thus came to take an interest in other languages and the teaching of them. His chief book was entitled: *Language as a Means of Mental Culture and International Communication; or Manual of the Teacher and Learner of Languages,* two volumes, London, 1853. Of this work Marcel published an abstract in French, *Premiers Principes d'Éducation avec leur Application Spéciale à l'Étude des Langues* (Paris, 1855). Marcel investigates thoroughly and comprehensively the whole field of education, and attempts thus to place language teaching in its true perspective. He treats of physical, moral, and intellectual education in his first book; of the signs of our ideas and importance of their acquisition in various languages in the second book; the three great agents of education (parents, teachers, methods) in the third book; the native tongue in the fourth book; order and relative importance of the different branches of a language, in the fifth book; of grammar, in the sixth book; then in successive books, of words; of reading; hearing; speaking; writing; and the time for learning a foreign language. He reduces his principles to twenty "logical" axioms. His methods were adapted to Italian by M. Jean Damiani, and to German and Latin by M. G. Théodore. The gist of Marcel's most valuable treatment of the teaching of modern languages is a recommendation of the direct or natural method. Marcel, in 1867, wrote a translation of part of his large book into French, under the title of *Étude des Langues ramenée à ses véritables Principes, ou l'Art de penser dans une Langue étrangère* (translated and published in New York, 1869) and a small pamphlet: *Méthode rationelle suivant pas à pas la Marche de la Nature pour apprendre les Langues étrangères, avec ou sans Maître* (translated and published in New York, 1875).

F. W.

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Quick, R. H. *Essays on Educational Reformers.* (New York, 1907.)

MARCH, ANDREW FRANCIS (1825–1911). — Philologist and leader in the American movement for spelling reform (*q.v.*); graduated at Amherst College in 1845. He taught in the public schools for four years, and then took up the study of law. In 1856 he accepted the post of professor of English language and comparative philology at Lafayette College, which he occupied for forty years. He was one of the earliest advocates of simplified spelling in the United States, and was president of the American Spelling Reform Association from 1876 to 1905. He wrote numerous pamphlets on the subject. His other educational writings include *Method of Philological Study, Parser and Analyzer for Beginners, Comparative Grammar of the Anglo-Saxon Language, Anglo-Saxon Reader, The A B C Book,* and many articles on philological subjects. He was editor-in-chief of the *Standard Dictionary* and the American editor of the *Oxford Dictionary.* W. S. M.

See Spelling Reform Movement.

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MARCUS AURELIUS. — Roman Emperor from 161 to 180 A.D., — a wise ruler, a brave general, a just and temperate man. His reign was marked by several great misfortunes: a plague, a famine, and successive inroads of the barbarians along the northern and eastern borders of the Empire. Though the barbarians were in the end successfully checked, they were a source of anxiety to the Emperor throughout his reign. The most serious impeachment of Marcus's good judgment was his persecution of the Christians.

The significance of Marcus Aurelius in the history of education lies in the fact that he established at Athens certain chairs of academic study with endowment from the imperial funds, and, by thus virtually creating what has been called the University of Athens, advanced the cause of education throughout the Empire. Certain steps had been taken by the previous Emperor, Antoninus Pius, looking toward the establishment of academic studies on a formal basis under the direction of the central government, but not before Marcus was anything like organization of the educational forces of Athens undertaken. Marcus was from his youth a friend and companion of Greek philosophers and at all times an admirer of Greek learning. Even after he became Emperor, he attended the lectures of the famous sophist, Herodes Atticus. In the second half of his reign he established at Athens, by the side of the chair of rhetoric, established in the reign of his predecessor, a second chair of greater dignity than the former. The higher salary which went with it was to be paid from the imperial funds, and the appointment to the chair was to be made by the Emperor. Later, probably in 176, he endowed at Athens two chairs in each of the four principal schools of philosophy — the Academic, the Peripatetic, the Stoic, and the Epicurean. The appointments to these chairs were to be made, after examination of the candidates, by Herodes Atticus. The holder of the chair of oratory ranked, at least in dignity, above the other professors. Marcus aimed to make of the city a real university center; as Dio Cassius says, " he gave to the whole world teachers at Athens, with annual salaries, in every branch of literary study."

The *Meditations* or *Thoughts* (τὰ εἰς ἑαυτόν) of Marcus Aurelius in twelve books are a collection of moral reflections and ethical maxims written in the spirit of the Stoic philosophy. The first section deals with his own education, and is a document of great value in revealing the character of Roman education under Stoic ideals. J. W. H. W.

See Stoics.

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Watson, P. B. *Marcus Aurelius Antoninus.* (London, 1884.)

MARENHOLTZ-BÜLOW-WENDHAUSEN, BERTHA VON (1810–1893).—The friend and admirer of Froebel (*q.v.*), who contributed more than any other person to make his work public. Of her early life it is not necessary to say anything here. She met Froebel in 1849, and at once appreciated the aims of the man who had been mentioned to her as "an old fool." She helped to introduce the unworldly teacher to others who could assist in bringing him into public notice. The chief among these was Diesterweg (*q.v.*). But her own efforts were considerable. Entering on her propaganda work in 1851, she did not relax her efforts until her death in 1893. In 1851 she lectured to a group of women in Berlin, explaining the *Mutter- und Koselieder.* With Diesterweg's help she founded a kindergarten at Pankow; but the period was unfavorable for any new educational ventures. In 1851 the establishment of kindergartens was forbidden in Prussia. After Froebel's death, which was a great blow to her, she devoted herself to the idea of founding an international Froebelian Society. She went to London in 1854, where she attracted attention. She lectured on Froebel and the kindergarten, and gave practical illustrations of this work in ragged schools (*q.v.*). Dickens noticed her in the *Household Words;* and an account appeared in the *Times* and *Athenæum.* While in London she published *Women's Educational Missions, being an Explanation of Froebel's System of Infant Gardens.* In 1855 she went to Paris, where she did similar work, was noticed in the press, and wrote *Manuel des Jardins d'Enfants.* She carried her propaganda into Belgium and Switzerland. In 1861 she returned to Germany, and with the help of a women's society founded a kindergarten in Berlin (1863), the prohibition having been removed in 1860. Then she established, with the coöperation of Karl Schmidt, Professor Virchow, and others, *Erziehung der Gegenwart,* an educational magazine. In 1870 she settled in Dresden, where she founded the *Froebelstiftung* with a kindergarten, a training college for kindergartners, and a home for kindergartners and governesses. In 1872 she succeeded in bringing into existence the *Allgemeine Erziehungsverein.* Her zeal for the work took her to Italy, where she aroused interest in the kindergarten in Florence, Rome, Naples, and Venice. Many of her works have been translated into English and include the following among others: *Die Arbeit und die neue Erziehung* (*Handwork and Headwork*), 1864; *The Child, Its Nature and Relations,* 1872; *The Child and Child Nature* (London, 1906); *The Kindergarten and the Importance of Children's Play,* 1882; *Reminiscences of Friedrich Froebel* (Boston, 1887); *Theoretisches und Praktisches Handbuch der Froebelschen Erziehungslehre* (Cassel, 1886–1887).

See Froebel, Friedrich; Kindergarten.

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MARGARITA PHILOSOPHICA. — See Encyclopedias; Encyclopedism.

MARIA THERESA (1717–1780). — Queen of Hungary and Bohemia, archduchess of Austria, and wife of the Holy Roman Emperor, Francis I. Interested as Maria Theresa was in securing the welfare of her country, she devoted considerable attention to education, not only in her immediate dominions, but also in Belgium. During her reign the control of the clerical party was diminished, the Jesuits expelled, and a general system of education introduced under the control by a Board of Studies (*Studienhofkommission*), in which the secular power was uppermost. She gathered around her the most capable educators of the day, *e.g.* Felbiger (*q.v.*), Kindermann (*q.v.*), and Van Swieten. The new law was promulgated in 1774, and its introduction, " . . . we have observed that the education of both sexes, the basis of the real happiness of nations, requires our especial care," shows her deep concern for reform. She had also encouraged the first university lectures in Vienna on experimental physics (1745) and mechanics (1757). In 1749 she had founded a military school at Wiener-Neustadt, in which "shall be formed men only and of them soldiers. In Belgium she had also reorganized the secondary school system, after expelling the Jesuits. A board of studies was appointed, classics were edited, corporal punishment was abolished, and public examinations were introduced. To supply the need, new schools, Theresian Colleges, were added. The reorganization of schools of art, design, and architecture was also encouraged by her.

See Austria, Education in.

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MARIETTA COLLEGE, MARIETTA, OHIO. — A coeducational institution founded in 1830 as the Institute of Education, and chartered in 1832. A collegiate department only is maintained. The entrance requirements are fifteen units. The degrees of A.B. and A.M. are conferred. The total enrollment in 1911–1912 was 152. There is a teaching staff of eighteen members.

MARION, HENRI (1846–1896). — French educator who exercised a decisive influence on the real trend of educational methods in the University of France. He was active in the organization of secondary education for girls. He gave the first course of Educational Psychology and Morals at the Normal School of Fontenay-aux-Roses. The chair of Science of Education at the Sorbonne was established for him, and was occupied by him with great distinction until his death. Marion was the author of *Devoirs et Droits de l'Homme* (1879); *Leçons de Psychologie appliquée à l'Éducation* (1881); *Locke,* in the portrayal of whom he gives, according to M. Boutroux, a picture of himself; *La Solidarité morale,* in which he points out to what extent determinism, which leads to freedom, in realizing itself binds the individual to his own past by habit and to the racial past by heredity and education. *Mouvement des Idées pédagogiques en France* (1889); *Instructions sur la Discipline* (1890), which brought about a transformation of the discipline in French education by substituting order as willed by the pupils for order imposed from the outside; *L'Éducation dans l'Université* (1892); and, posthumous, *l'Éducation des jeunes Filles; la Psychologie de la Femme* (1900). Endowed with great charm, an excellent teacher, a man of good sense, a steadfast character, of fine and sensitive feeling, Marion exercised a decisive influence on several generations of teachers. His principle was that all means of the educative process ought to lead to the formation of a moral person (*moralisme*), and that national education well directed ought to improve the race and bring humanity to a better state (*méliorisme*). J. P.

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MARIST COLLEGE, ATLANTA, GA. — A Catholic institution incorporated in 1902 and conducted by the Marist Fathers. Grammar grades, high school, and college departments are maintained. Students are admitted by certification from high schools. The A.B. degree is conferred.

MARIST FATHERS, THE, SOCIETY OF MARY. — See Teaching Orders of the Catholic Church.

MARIST SCHOOL BROTHERS, THE. — See Teaching Orders of the Catholic Church.

MARKINGS. — See School Management; also Records and Reports.

MARLBOROUGH COLLEGE. — See Grammar School; College; College, English; Public Schools.

MARQUETTE UNIVERSITY, MILWAUKEE, WIS. — See Jesus, Society of, Educational Work of.

MARSEILLES, UNIVERSITY OF. — See Aix-Marseilles, University of; France, Education in.

MARTHA WASHINGTON COLLEGE, ABINGDON, VA. — A college for women, established in 1853 and now controlled by the Methodist Episcopal Church, South. Preparatory, collegiate, and music departments are maintained. Fourteen points of high school work are required for admission to the college, which confers the degrees of A.B. and B.S. In 1911–1912 the teaching staff consisted of nineteen members, and the student body of 145.

MARTHA'S VINEYARD SUMMER SCHOOL. — See Summer Schools.

MARTIANUS, MINEUS FELIX CAPELLA. — See Capella, Martianus Mineus Felix.

MARTIN OF BRAGA, or BRACARA (*c.* 520–580). — Bishop of Dumio in northwestern Spain, where he was the leader in the conversion of the Suevi to the Catholic faith. He is the author of a little work on moral training, *Formula vitæ honestæ,* also known as *De differentiis quatuor virtutum,* which enjoyed great popularity in the Middle Ages. In this and other works of a moral and ascetic character he is largely dependent upon Seneca.

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MARTINEAU, JAMES (1805–1900). — English philosopher and divine, brother of Harriet Martineau, was educated at Manchester College, and became a Unitarian minister. He was for forty-five years professor of mental and moral philosophy at Manchester New College, London. He exerted a wide influence as a preacher, and won a high reputation as a writer on religion and philosophy. This was somewhat injured by his radical criticism of Spinoza and his idealistic theory of the Church, which was of an academic and impracticable character and fell still-born. In philosophy he was an intuitionalist, holding that men have a power of conscience by which they can estimate moral values without the help of experience. His best work was done as a teacher of ethics and a defender of fundamental truths against the attacks of atheism, skepticism, materialism, and other negative tendencies in the nineteenth century. He wrote many volumes of sermons and essays for the periodical press. His chief works are the *Types of Ethical Theory*, the *Study of Religion*, and the *Seat of Authority in Religion*. These contain his best teaching in its final form. W. R.

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MARTINIQUE. — See French Colonies, Education in.

MARWEDEL, EMMA (1817–1893). — Kindergartner. She was educated in the schools of Germany, and for six years was connected with the kindergarten training department of the Industrial Art School for Women at Hamburg (1865–1871). Through the efforts of Elizabeth P. Peabody (*q.v.*) she was induced to come to America and engage in the work of training kindergartners. She conducted training schools for kindergartners at Washington from 1872 to 1876, and at Los Angeles and San Francisco from 1876 to 1890. Among prominent American kindergartners trained by Miss Marwedel are Kate Douglas Wiggin and Nora A. Smith. Her published writings include *Conscious Motherhood, or the Earliest Unfolding of the Child* (Boston, 1889), and *The Connecting Link to Continue the Threefold Development of the Child from the Kindergarten to the Manual Labor School* (San Francisco, 1890). W. S. M.

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MARYLAND AGRICULTURE COLLEGE, COLLEGE PARK, MD. — A state institution established by legislature in 1856 and opened in 1859. The following departments are maintained: agriculture, botany and vegetable pathology, chemistry, civil, electrical, and mechanical engineering, physics, English and civics, entomology and zoölogy, horticulture, languages, mathematics, military service, oratory, physical culture, veterinary, and preparatory. Students are admitted by special examination. The degrees of B.S., M.S., A.M., M.E., and C.E. are conferred. The enrollment in 1910–1911 was 416. The teaching staff consists of thirty members.

MARYLAND COLLEGE FOR WOMEN, LUTHERVILLE, MD. — Chartered in 1853 and 1895 as an institution for the higher education of young women. Preparatory, collegiate, and music departments are maintained. High school graduates are admitted to the junior class. The degrees of A.M. and B.L. are conferred. The teaching staff consists of eighteen members.

MARYLAND, STATE OF. — One of the original thirteen states. It is located in the South Atlantic Division, and has a land area of 9860 square miles. In size it is about the same as New Hampshire or Vermont. For administrative purposes the state is divided into twenty-four counties, and these in turn into school districts. In 1910 Maryland had a population of 1,295,346, and a density of population of 130.3 per square mile.

Educational History. — The original colonial charter made no mention of education. In 1695 the colonial assembly passed two acts, one for the encouragement of learning, and the other a supplicatory petition for the erection of free schools. The first was repealed in 1704, and the second in 1696, and neither resulted in any action. In 1796 a "petitionary act for free schools" was passed, looking to the erection of free schools of a higher grade in each county. As a result of this, King William's School was founded at Annapolis as a preparatory school for William and Mary College. The plan inaugurated at this time, of founding one free higher school in each county, directed the educational efforts of Maryland for a century and a half, and is still to be seen in the annual appropriations to certain schools and academies, in consideration of the free instruction of a certain number of pupils. In 1723 a fund for the erection and support of a free higher school in each county was begun, by an import tax on pitch, pork, and tar; and trustees, called visitors, were appointed for each county, to manage the fund for each county, establish and maintain the school, and to have perpetual succession as a body. In 1728 the visitors were directed to see that the masters of each higher school taught as many poor pupils gratis as the visitors might direct. A county system of higher schools, or academies, was thus definitely established, and the principle of charity school education for the children of the poor became a fixed policy. What had been intended to be free schools, due to lack of funds with which to maintain them, were gradually transformed into pay schools with a fixed number of poorer pupils. Almost no mention of education occurs in the laws from this time on until after the close of the Revolution. The schools languished for want of funds, and a number gave up their funds for other purposes.

The first state constitution, adopted in 1776, was amended twelve times during the next seventy years, but without any mention of the subject of education. The constitution of 1851 was similarly silent, except for the one provision forbidding ministers, teachers, and religious orders and sects from receiving property left as a legacy or gift for their support. The first mention of education occurs in the constitution of 1864.

In 1782 Washington College was established at Chestertown, on the east shore, and in 1784 St. John's College was established at Annapolis, on the west shore. Annual legislative grants forever, of £1250 and £1750 respectively, were promised, and the two institutions together were to constitute the University of Maryland. In 1798 the policy of dispersion, which has wrought such havoc in education in Maryland, was begun, when the annual grant to Washington College was reduced £500 and the sum spent in making grants of £100 each to five academies, two of which had just been chartered. In 1805 the University of Maryland act was repealed, and the money ordered to remain in the treasury until otherwise disposed of; and in 1811 the sum was ordered to be distributed to a number of schools and academies. In 1827, and again in 1831, unsuccessful attempts were made to divert the academy funds to elementary education; and in 1831 the academy grant was equalized to $800 for each county. This system remains to the present time, the state virtually supporting two systems of secondary education. In 1823 each academy was ordered to receive at least one poor child for every $100 of public money received, and this proportion has since been increased. The Maryland school law of to-day defines in detail the number and method of selection of the free pupils for these schools. In 1812 a new charter was granted to the College of Medicine in Maryland, and it was allowed to affiliate with it schools of law, divinity, and the liberal arts. The law and medicine faculties still survive, as departments of a so-called University of Maryland.

In 1799 the Benevolent Society of the City of Baltimore was organized to provide elementary education for the female children of the poor. In 1805 St. Peter's School for poor children was established. Between 1801 and 1817 many academies and higher schools were incorporated and aided, and during these years the lottery, as a means of aiding education, reached its height. In 1812 a school fund had been begun by a tax on banks, which in 1813 was changed to a rate of taxation on bank stock. In 1814 the unclaimed estates of persons dying intestate were added in Baltimore. In 1817 a lottery to raise $50,000 a year for five years was ordered, the proceeds to be added to the fund. In 1825 certain interest received from the United States was ordered added, and, in 1839, some railway stock was substituted for a portion of the Surplus Revenue previously added.

In 1816 the first direct tax, a tax on the property of five counties to provide schooling for the poor children of those counties, was levied, and later in the same year this tax was extended to all the counties of the state. The tax was to aid rather than to provide, and the children benefited were a class and not all.

In 1826 the first general school law for Maryland was enacted, but the uniformity of its action was nullified by the provision that the law could go into effect in any county only after its adoption by popular vote in the county. A Superintendent of Public Instruction for the state was to be appointed by the Governor; the justices of the levy courts in each county were to appoint a board of nine county commissioners, and eighteen additional inspectors of primary schools, who were to visit the schools once each quarter, and to report as to their condition. Counties were to be divided into school districts, and three district trustees, a district clerk, and a district collector, were to be elected for each. All teachers were required to hold teachers' certificates, issued on examination by the Inspectors. The income from the state school fund was to be apportioned to the counties and to the districts on the school census, and all additional funds were to be raised by district taxation. The act was to apply to the city of Baltimore, if within five years the city did not establish a system of schools. The law was so far in advance of public sentiment that it could not be put into operation, and the close of the Civil War found Maryland without any effective system of public instruction beyond the limits of the city and county of Baltimore. (See BALTIMORE, CITY OF.) From this time on no further attempt was made to establish a state school system.

The state constitution of 1864 was the first to mention education. This, and the law of 1865 based upon it, provided for a centralized and an effective system of administration, with a State Superintendent of Public Instruction; an *ex officio* State Board of Education; county school commissioners appointed by the State Board of Education; a state school tax of not less than ten cents on the $100; and an additional tax of five cents to build up a permanent school fund of $6,000,000. The State Superintendent was to report to the next legislature a plan which would provide for a uniform system of free public schools for six months each year in each school district of the state. A normal school was established in Baltimore by the legislature of 1865.

In 1867 a new constitution was adopted, which is still in force; and in 1868 a new school law was adopted as provided for in the constitution. This was more in harmony with the strong feeling of local liberty in the state, and has remained as the basis of the present system. The State Board of Education and the state superintendency were abolished, but some of the functions of the State Board were given to the board of trustees of the state normal school, and the principal of the normal school was made an *ex officio* superintendent. The board of county school commissioners was to be elected by the people instead of being appointed by the State Board. An elected " board of schoolhouse district trustees " was created to appoint the teachers and manage the property of each school district. The school term was increased to ten months, and county taxation was authorized to supplement the state school money. No provision was made for the education of colored people, except to provide that taxes paid by them should be spent on their schools. This law was much more popular than that of 1865, and much greater progress was made under it.

In 1870 the 1868 law was repealed and reenacted with some changes. The State Board of Education was restored, under the name of State School Commissioners, and made to consist of the principal of the normal school and four others, appointed by the Governor from among the presidents and examiners of the county boards of school commissioners. County boards were, in turn, to be appointed by the judges of the circuit court, instead of elected, and school district boards were made to consist of three trustees, appointed annually by the county boards, instead of being elected. Life teachers' certificates were provided for for the first time. In 1872 provision was made for the establishment of schools for colored children in each county, and a state appropriation was made therefor. In 1874 the Governor was added to the State Board of Education (name changed in 1872), and the Board was given some legislative powers. The election of teachers by district boards of school trustees was made subject to the approval of the county boards. In 1904 the State Board of Education, and in 1906 the county boards of school commissioners, were reconstructed and given their present form.

In 1896 a normal department was organized at Washington College, Chestertown, and in 1898 a second state normal school was provided for at Frostburg. In 1908 a third state normal school was provided for colored teachers, to be located in Baltimore, and college courses in pedagogy were allowed to be approved by the State Board of Education for state certificates. In 1908 aid for high schools providing manual training courses was first given by the state, and in the same year state grants for commercial courses in high schools were also provided. In 1904 provision was made for an annual state grant of $150,000, to be distributed to the counties and to the city of Baltimore, on school census, to provide free textbooks. In the same year a law was enacted, providing for a minimum salary of from $300 to $450 per year for white teachers; and in 1908 this law was amended so as to provide higher minimum salaries for teachers of experience. A state pension law was also enacted in 1908, and an educational commission appointed. In 1910 the high schools were classified and standardized, and definite aid extended to them out of the state school fund.

Present School System. — The educational affairs of the state are under the care and supervision of a State Board of Education, consisting of the Governor, the State Superintendent of Public Education, and six citizens appointed by the Governor for six-year terms, two of whom must be of the minority political party. The principals of the state normal schools and the head of the normal department of any state schools are *ex officio* members, but without the right to vote. It is the duty of the State Board to carry out the school law, and in doing so they may make rules and regulations having the effect of law; they are to interpret the school law, decide disputes, and their decisions are final; to issue uniform blanks and to require uniform accounts and reports; to examine candidates for the office of county superintendent, and they may suspend or dismiss county superintendents for cause; to grant professional certificates to teachers of long and successful experience; and to act, *ex officio*, as a Board of Trustees for the state normal schools, and to approve a pedagogical course for colleges wishing to be permitted to grant teachers' certificates to their graduates.

The State Superintendent of Public Education is also appointed by the Governor, for a four-year term, and may be removed from office by the State Board of Education by a two thirds vote. His salary is fixed by the State Board. He is *ex officio* a member of this body, and its secretary and executive officer. It is his work to inform himself as to the condition of education in Maryland; to work to improve educational conditions; to receive and examine all reports from county boards; to endorse normal school diplomas from other states; to arrange dates for teachers' institutes, and to help in the preparation of the program; to print and distribute the laws, an Arbor Day pamphlet, an Institute Manual, the Proceedings of the Maryland Teachers' Association, and such circulars as may be needed; to serve *ex officio* as a member of the State Library Commission; with the principal and one of the faculty of a state normal school to examine the high schools of the state and to report the results to the State Board of Education; and personally to inspect the manual training courses in the high schools of the state, and to approve them for state aid.

For each county there is a board of county school commissioners, also appointed by the

Governor. In six of the larger counties the board consists of six members; in the remaining counties, of three. The term of office is six years, one third appointed every two years, and one third being of the minority political party. No teacher is eligible, and the Governor may remove any member for cause. This board elects the county superintendent of public education, who also acts as treasurer and secretary of the board. The county board has general supervision and control of the schools of the county, and may make rules and regulations, not contrary to law, for that purpose; may select sites, build, repair, and furnish schoolhouses; is to adopt, purchase, and distribute the textbooks to be furnished; must approve the appointment of the principal teachers for all schools, and appoint all assistant teachers, on the advice of the principal; may consolidate schools and transport pupils; may determine the amount of county school tax to be levied; may change the boundaries of districts as seems desirable; hears all charges against teachers, and settles all disputes within the county subject to appeal to the State Board; must maintain one or more free schools for colored children in every election district; must maintain a high school when presented with a high school building by any election district or districts; and must make a report annually to the State Board of Education and to the people of the county.

The county superintendent of public education, elected by the county board, acts as its executive officer. He examines all candidates for county teachers' certificates, and grants certificates to those who pass; must visit each school in the county from one to three times each year, depending upon the number of schools in his county; attends all meetings of the board, and may speak, but has no vote; prepares an annual report for the State Board; and must devote his entire time to the work of supervision. His salary is fixed by the county board.

For each school district a board of district school trustees is appointed each year by the county boards. Each district board is allowed, on approval by the county board, to elect its principal teacher, who thereupon becomes *ex officio* secretary of the district board. These boards have the care and repair of the schoolhouse and furniture of the district; may make repairs, if approved by the county board; may exercise general supervision over the school, subject to the rules and regulations of the county board; may admit, suspend, or expel pupils and may levy additional district taxation to provide a longer term of school. The city of Baltimore is a district operated under a special charter. (See BALTIMORE, CITY OF.)

School Support. — Maryland received no school lands, and the permanent school fund, including the Surplus Revenue fund, which has but a nominal existence, is about one million dollars, and yields about $50,000 a year, or about 1.5 per cent of all revenue raised. The annual state school tax of sixteen and one eighth cents on the $100 produces about 40 per cent of all money raised. The remainder comes from the free school fund, and grants for secondary education. The annual state grant of $150,000 for free textbooks now comes out of the general state school tax. About 58 per cent comes from a county school tax of fifteen cents, which, by agreement between the county school board and the county commissioners, may exceed fifteen cents. The total amount expended for education in 1909–1910 was $4,060,341, of which 44 per cent was expended by the city of Baltimore.

Educational Conditions. — Of the population of 1910, about 20 per cent were negroes, and about 90 per cent were native born. Of the foreign born, one half were Germans and one sixth Irish. Only in three counties do the negroes equal the whites in number. It is necessary to maintain two school systems for the two races. Aside from the city of Baltimore, which contains 42.8 per cent of the total population of the state, the state is essentially a rural state, as 49.2 per cent live in rural districts.

The law requires a school term of ten months "if possible." The average length of term for eleven counties and the city of Baltimore was ten months, for eleven counties it was nine months. In respect to length of term provided, Maryland ranks with the New England states. The attendance, however, is poor, being but an average of 102.9 days for each pupil enrolled in 1909. Twenty-one per cent of the total enrollment and 22 per cent of the teachers were in the colored schools, which is more than their percentage of the total population. The state has no general compulsory education law, which accounts for these low figures. Baltimore city and Allegheny County enforce attendance. Of the total population of 1900, ten years of age or over, 11.1 per cent were illiterate. Of the two races, 5.2 per cent of the whites and 35.1 per cent of the colored race could not read or write. The average value of all the schoolhouses in the state, including the city of Baltimore, is but about $1600. In the rural districts, and particularly in the negro districts, many of the school buildings are of small value.

Teachers and Training. — The state employed 5414 teachers in 1910, 3736 being outside of the city of Baltimore. Of this number 823, or 22 per cent, were employed in the colored schools, 212 being in the city of Baltimore. No statistics are available to show the kind and amount of training which these teachers have had. Two grades of county teachers' certificates are issued on examination, the difference being in the subjects examined on. A very meritorious provision is that each certificate is valid for six months after obtaining a school, after which, if the Superintendent's inspection warrants, the certificate is made valid for five years. County superintendents must hold a certificate issued by the State Board of Education, which also issues, without examination, life diplomas for seven years of successful teaching, five of which must have been in Maryland. Normal school diplomas from outside of the state may be accepted by the State Superintendent, and the diplomas of the three state normal schools and the normal department of Washington College are also accepted in any county.

School	Location	For Maintenance	For
Maryland State Normal School	Baltimore	$20,000	Whites
Maryland State Normal School	Frostburg	7,000	Whites
Normal Department Washington College	Chestertown	4,500	Whites
Maryland State Normal School No. 3	Baltimore	5,000	Colored

The salaries of teachers are fixed by the county board, at the time of employment, except that no white teacher can be paid less than $300 a year, and no white teacher of three years' experience less than $350 a year. If the teacher holds a first-class certificate and has taught in Maryland five years, the minimum is $400, and if eight years, $450. Any incapacitated or indigent teacher of sixty years of age or more, who has taught twenty-five years in the schools of Maryland, may be retired on an annual pension of $200.

The Maryland Teachers' Reading Circle was established in 1890, for the improvement of teachers in service, and the law requires that this shall be encouraged by the State Board of Education. A teachers' institute, of at least five days, must be held in each county, and teachers are required to attend. The state now maintains four normal schools (see above table). For each of these, county and city boards of school commissioners are to select candidates for admission and grant a certain number of scholarships for the course.

Secondary Education. — The state at present maintains a double-headed system of secondary education, and, as a result, few good public high schools, outside of Baltimore, have been developed in the state. Many of the old academies have surrendered to the state and become public secondary schools, but seventeen of the old incorporated academies and schools still receive state grants of from $150 to $3000. The law of 1910 attempted to classify and standardize the high schools of the state, provided definite state aid for approved schools, to be paid from the state school fund instead of by special appropriations, and made the approval of both the County and the State Board of Education necessary for the establishment of new schools. This new law will do much to give Maryland a good system of secondary education. The county agricultural high schools, provided for in 1912, will also prove a very important feature.

Higher and Special Education. — The same policy of dispersion of aid which characterizes secondary education also applies to higher and special education. The University of Maryland consists only of medical and law departments, first opened in 1807 and 1814 respectively. The Maryland State Agricultural

Institution	Location	Opened	Control	State Aid	For
Charlotte Hall Academy	Charlotte Hall	1774		$ 6,600	Males
Washington College	Chestertown	1783	Non-sect.	13,275	Both Sexes
St. John's College	Annapolis	1789	Non-sect.	14,200	Males
Medical Department of University of Maryland	Baltimore	1807		4,000	Males
Mt. St. Mary's College	Emmitsburg	1808	R. C.		Males
Law School, University of Maryland	Baltimore	1814			Males
New Windsor College	New Windsor	1843	Presby.		Both Sexes
St. Mary's Female College	St. Mary's City			6,000	Women
McDonough Institute	La Plata			5,000	Both Sexes
St. John's Literary Institute	Frederick			400	Males
Maryland Institute	Baltimore			10,000	Both Sexes
U. S. Naval Academy	Annapolis	1845	Nation.		Males
Loyola College	Baltimore	1852	R. C.		Males
Kee Mar College	Hagerstown	1852	Non-sect.		Women
Maryland College for Women	Lutherville	1853	Luth.		Women
Rock Hill College	Ellicott City	1857	R. C.		Males
Maryland Agricultural College	College Park	1859	State	15,000	Males
Morgan College	Baltimore	1867	M. E.		Both Sexes
Western Maryland College	Westminster	1867	Meth. Prot.	15,800	Both Sexes
College of Physicians and Surgeons	Baltimore	1872		4,000	Males
Johns Hopkins University	Baltimore	1876	Non-sect.	25,000	Males
Baltimore Medical College	Baltimore	1881		4,000	Males
Woman's College of Baltimore	Baltimore	1888	M. E.		Women
Woman's College	Frederick	1893	Reform		Women

College, at College Park, was opened in 1859. Some state aid has from time to time been extended to Johns Hopkins University. In 1912 a state school of technology was established in connection with the university, with a state tax of $\frac{3}{4}$ cent annual revenue. This will produce $50,000 each year. The dispersion of educational effort may be seen from the table of colleges in the state on previous page.

The state maintains the Maryland School for the Deaf and Dumb, at Frederick; and grants state aid to St. Mary's Industrial School (for boys) and St. Peter Claver's School, both at Baltimore. The Maryland (reform) School for Boys, at Baltimore, and the House of Reformation, for boys, at Cheltenham, are supported by public funds. E. P. C.

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STEINER, B. C. *History of Education in Maryland. Circ. Inform.*, No. 2, 1894, *U. S. Bur. Educ.*, 331 pp.

MARYVILLE COLLEGE, MARYVILLE, TENN. — A coeducational institution founded in 1819. Preparatory, collegiate, education, music, and art departments are maintained. The entrance requirements are fifteen units. The degree of A.B. is granted by the institution. The total enrollment in 1911–1912 was 649. The teaching staff consists of thirty-nine members.

MASON, LOWELL (1792–1872). — First apostle of public school music in the United States. He was born at Medfield, Mass., and received the rudiments of an elementary education in the common schools. After several years of teaching in the district schools of Massachusetts, he went to Georgia, where he taught music and conducted choirs and singing societies. Returning to Boston in 1827, he organized the Boston Academy of Music with the aid of William James Webb (*q.v.*). Through William C. Woodbridge (*q.v.*) he became interested in the Pestalozzian movement and went to Switzerland to study the work of Nägeli (*q.v.*) and Pfeiffer. He brought back with him a collection of Swiss and German schoolbooks containing class music and songs.

Failing in his efforts to induce the city of Boston to include music as one of the required studies of the elementary schools, he organized classes of children on Wednesday and Saturday afternoons and taught gratuitously from five to six hundred children for several years. The juvenile concerts that he gave from time to time convinced the people of the value of his work, and music was made one of the required subjects in the course of study.

In addition to his work with the children and the Boston Academy of Music, he was president of the Handel and Haydn Society, and in a variety of ways he sought to improve and extend musical taste in New England through the giving of concerts, the formation of singing societies, the organization of church choirs, and the establishment of lecture courses on musical subjects. In 1837 he became associated with Horace Mann (*q.v.*), and during the next twelve years he gave much of his time to the training of teachers of common school music in the institutes and normal schools of Massachusetts. "His long continued work as a practical teacher, his rare tact in developing the vital principles of instruction, his sympathy with youth and childhood, and the perfect simplicity and elementary character of his teaching gave him an indescribable power over his audiences."

His influence was likewise great through his published works. His *Juvenile Psalmist* was published in 1829. It was one of the first music books ever published for Sunday schools, and it was widely used. During the next few years he published fourteen music books for children. He also published many works for glee clubs, church choirs, and singing societies; and his *American Tune Book*, six hundred thousand copies of which had been sold before his death, greatly enriched American hymnology. As a creative tone artist, he limited his efforts to church tunes; but many of these are highly creditable productions. His contributions to the pedagogy of music may be found in the *Proceedings* of the American Institute of Instruction and the educational journals of his day. W. S. M.

See MUSIC.

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MASON, LUTHER WHITING (1821–1896). — Music educator and author. He was self-educated, became supervisor of music in the schools of Kentucky and Ohio (1853–1861), and during the Civil War served as a drum major. From 1865 to 1880 he was connected with the public schools of Boston as supervisor of music. The next three years (1880–1883) he spent in Japan as organizer of public school courses of music in that kingdom. He wrote a series of music textbooks widely used in the United States. W. S. M.

MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST, MASS. — A coeducational institution established under the Morrill Land Act of 1862 and opened in 1867. In 1882 the state experiment station was located at and later incorporated with the college. All instruction is free to citizens of

Massachusetts, to candidates who meet the entrance requirements — fourteen units of high school work. The following departments are maintained: agriculture, horticulture, botany, entomology, plant and animal chemistry, veterinary science, mathematics, social sciences, and humanities. Extension work is conducted by the college, and provides short courses, lecture courses, and correspondence courses. The degrees of B.S., M.S., and Ph.D. are conferred by the college. The enrollment in 1911–1912 was 520. The faculty consists of sixty members.

MASSACHUSETTS COMMISSION OF INDUSTRIAL AND TECHNICAL EDUCATION. — See COMMISSIONS, EDUCATIONAL.

MASSACHUSETTS INDUSTRIAL COMMISSION. — See COMMISSIONS, EDUCATIONAL.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, BOSTON, MASS.—An institution incorporated in 1861 for the purpose of "aiding generally by suitable means the advancement, development, and practical application of science." It was not until 1865 that it was possible to make an actual beginning even with the most modest equipment in leased rooms of a building in Summer Street, Boston. The equipment in men, however, was strong from the beginning, the best known of the original faculty of ten being Rogers, the founder and first president, and Eliot, afterwards president of Harvard. The courses in these early days were especially designed to prepare men for mechanical and civil engineering and for the professions of the architect and the chemist. In 1881 President Rogers was succeeded by General Francis A. Walker, under whose guidance the number of students increased from 300 to 1200 and the number of the instructing staff from 39 to 153. Following General Walker were : James M. Crafts (1897–1900), Henry M. Pritchett (1900–1907), and Richard C. Maclaurin (1909–).

The Institute is one of the land grant colleges, and in addition to the income that this position secures, it receives an annual grant of $100,000 from the legislature of Massachusetts. Its tuition fee is $250, and its budget for 1911 was $615,571. The government is vested in a Corporation, consisting of five *ex officio* members, thirty-five life members, and fifteen members elected for terms of five years from a group of candidates nominated by the alumni. The Corporation conducts much of its business through an Executive Committee consisting of the president, treasurer, and five other members. The instructing staff in 1911 consisted of 245 members, of whom 91 were of professorial grade. These professors constitute the faculty, which has the immediate supervision of all matters relating to the courses of instruction and to the admission and conduct of students. Exclusive of the summer school, the number of students in 1911–1912 was 1566, of whom 399 were from other colleges, and 212 were college graduates representing 112 colleges. Over a hundred came directly from foreign countries and almost every state in the Union was represented. There were only seven women, although women are admitted to any of the courses. The regular course of undergraduate study runs between the end of September and the beginning of June for four years, and leads to the degree in any one of the following fourteen branches: civil engineering, mechanical engineering, mining engineering and metallurgy, architecture, chemistry, electrical engineering, biology and public health, physics, general science, chemical engineering, sanitary engineering, geology and geodesy, naval architecture and marine engineering, and electrochemistry. In each of these courses a large proportion of work of a literary and scientific character is insisted upon, and a serious effort is made to break down the barriers between professional and cultural studies. Opportunities are also afforded for study and research leading to the advanced degrees of M.S., Ph.D., and Doctor of Engineering. Although research is carried on in all departments, there are laboratories especially designed for purposes of research in physical chemistry, applied chemistry, and public health, and contributions from these laboratories are published periodically by the research departments. R. C. M.

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ROGERS, W. B. *Life and Letters.* (Boston, 1896.)

MASSACHUSETTS, STATE OF. — One of the most important states, educationally, in the Union. The first permanent settlement in New England was made at Plymouth, in 1620. Salem was settled in 1628, and Boston, Charlestown, Newtown (Cambridge), Roxbury, Dorchester, and Watertown were settled by the Massachusetts Bay Company in 1630. The Massachusetts Bay Colony at once became the leading colony, and in 1691 Plymouth Colony was united to it by the new charter granted by William and Mary, which remained in force until the Revolution. In 1788 Massachusetts entered the Union, as one of the thirteen original states. In size the state has but 8039 square miles, being fifth from the smallest state, but in population it ranked sixth from the largest in 1910, and the density of population, 418.8 per square mile, is only exceeded by that of Rhode Island.

Its population in 1910 was 3,366,416. For administrative purposes the state is divided into 33 cities and 321 towns. The towns are small, being somewhat analogous to a Western township. The cities are towns which have incorporated under a city form of government, or a segregated area so incorporated. There are also fourteen county divisions, but these are little used.

Educational History. — Education began in Massachusetts under most favorable auspices. The colonists who settled in the Massachusetts Bay and Plymouth colonies were men of broad and liberal education, who had come to the new world for conscience' sake. The population of our country has never been so highly educated since as it was during the first fifty years of Massachusetts history. Many had been educated in the endowed grammar schools of England, and one man in every 250 was a graduate of an English university. Almost all had been conspicuous in Church and State in the mother country before coming to the new world. Their religion called for a knowledge of God's word, and this in turn called for education. They early set up schools, patterned closely after those they had known at home. Fearing that education and religion might die with the first generation, they provided at once for institutions to perpetuate both.

The beginnings of education in Massachusetts were made at Boston, in 1635, when the town, then five years old, requested Brother Philemon Purpont to become schoolmaster. The Boston Latin School traces its history back to this time. (See Boston, City of.) The next year the General Court of the colony voted an appropriation of "£400 toward a school or college," which was located at Newtown in 1637. In 1638 John Harvard, dying, bequeathed his library and half his property to the new college, and the name of Harvard College was given to the new institution, and the town where it was located was renamed Cambridge, in loving memory of the *alma mater* of so many of the early colonists. The grant made by the court for the new college was a most important one, and was equal to the entire colony tax for a year.

Other towns also established schools at an early date. Charlestown arranged with William Witherell in 1636 "to keep a schoole for 12 month, to begin the 8 day of August, and to have £40 this year." In 1637 Rev. John Fiske opened a school in Salem. Dorchester opened a public tax-supported school in 1639. Newbury granted ten acres of land to Anthony Somerby in 1639 "for his encouragement to keep a school one year." Schools were opened in Ipswich in 1641, Cambridge in 1642, and Roxbury in 1645. In 1641 the General Court appealed to the elders of the church to prepare "a catechism for the instruction of youth in the grounds of religion." In 1642 the court enacted the first school law of the colony, which was an attempt to provide generally what a few towns had so far provided individually.

By this law the court, in view of the neglect of many parents and guardians in the training of their children "in learning and labor . . . profitable to the commonwealth," ordered the selectmen of the towns to take account of all parents and masters as to their children's education and employment. They were to divide the towns so that each should have the oversight of a certain number of families, and they were to see that the children could read and understand the capital laws of the country, and that they were also put to some useful work. Parents or masters refusing to give proper accounts were to be fined, and their children might be taken away from them. The civil authorities might be called upon by the selectmen to secure the enforcement of the law. This law laid down certain principles of fundamental importance in the matter of public education. Education was by it declared to be necessary for the welfare of the colony; the obligation to furnish it was placed upon the parent; and the right of the colony to compel parents to furnish it was asserted.

Five years later, in 1647, the colony in a new law went still further, and required the towns to furnish a school or schools. This law of 1647, commonly known as "that old deluder Satan law," is the real foundation of the Massachusetts school system, and has often been called the mother of all of our school laws. A college had been established, and elementary schools and grammar schools were now ordered established in all towns. Every town of fifty families must appoint a schoolmaster to teach the children of the town to read and to write. The wages of the schoolmaster were to be paid by the parents, or by the town, as the majority might order. Every town of 100 families must also provide a grammar school, the master of which was to be able to instruct the youths sufficiently to enable them to enter the university. In 1654 the court ordered that all teachers must be sound in the faith and free from scandal in their lives, on pain of dismissal. Plymouth Colony also attempted somewhat similar legislation, though somewhat later, and on the union of Plymouth Colony with that of Massachusetts Bay in 1691, the law of 1647, with its various amendments, became the common school law for the entire united colony. In this new law the colony laid down still further fundamental principles. Towns were now to be compelled to provide schools; a standard of instruction was fixed by the colony; public taxation could now be resorted to to provide what the colony required; and higher education, leading to the university, also must be provided, and might be provided at public expense. The law of 1654 declared the right of the colony to examine and certificate all teachers. These principles were so fundamental in their nature that we have acted along these lines ever since, while they were at the same time so far in advance of the people that it was found difficult to enforce the laws, and even Massachusetts has not fully caught up with them yet.

The fine for failure to comply with this law was at first fixed at £5. A supplementary law of 1683 further required all towns of 500 families to maintain two grammar schools and two writing schools, and in the reënactment of the laws in 1692, under the new province charter of 1691, the penalty for neglect to maintain the required schools was raised to £10. In 1701 the Massachusetts Court complained that the law was " shamefully neglected by divers towns, and the penalty thereof not required." At the same time the penalty was increased to £20, and a law was enacted whereby the master of the grammar school must be approved by the minister of the town and by the ministers of the two nearest towns, or by any two of them, and providing that no minister could be accepted as the schoolmaster of his town.

The grammar schools of Massachusetts did much, during the seventeenth century, to contribute to the fame of the colony as an educational center. The work of Ezekiel Cheever (*q.v.*), and of Elijah Corlett, who taught the school at Cambridge for forty-three years, are especially noteworthy. Other towns founded grammar schools during the seventeenth century, many of which were locally famous. Many grants in aid of schools, such as the grant of Thompson's Island to the town of Dorchester in 1636; the grant of 1000 acres of land by the General Court in Cambridge in 1659, for the support of a grammar school; the will of Thomas Bell in 1671, granting 200 acres of land to support a school for the children of the poor in Roxbury; and the income from the Cape Cod fisheries, granted by Plymouth in 1670, were made during the seventeenth century for the support of schools.

In the eighteenth century conditions changed. The early fervor for schools and learning in large part died out. It was a period of warfare and invasion, on the one hand; and of the founding of new settlements and towns, with a westward movement of the population, on the other. Between 1700 and 1760, 123 new towns were founded, and in the next ten years forty-five more, nearly all of which were west of the Connecticut River. Schoolmasters were becoming scarce, even by the end of the seventeenth century, due largely to the unwillingness of the towns to bear the financial burden of the schools; and special favors began to be granted to them in lieu of proper wages. In 1692, as an inducement to enter the work, teachers were exempted from taxes; in 1693 they were exempted from militia duty; and in 1699 they were exempted from the watch. Women teachers, too, became more common, and the dame schools were gradually absorbed into the town school system. The " moving school " (*q.v.*) became common in the newer and more sparsely settled towns. Towns which felt themselves too poor to provide a sufficient number of schoolmasters employed one and sent him around among the districts, and he gave instruction in each in proportion to the contribution of each toward his support. The support of the required grammar school, too, became a grievous burden, and many towns were indicted for failure to comply with the law. In a few towns it, too, became a moving school. The school spirit declined, and the school decayed.

The constitution of 1789 and the school law enacted by the new state embodied into law the practices as well as the principles of the past 150 years. The old laws had contained requirements so high that they could not be enforced. While retaining the old principles, the new law set requirements capable of being enforced. The district system was legalized. Towns of fifty families were to support an English school for six months, instead of the whole year as before, and the school might be split up into any number of sessions. Towns of 100 families were to continue such a school for an aggregate of twelve months in each year. Towns of 150 families were to maintain an English school for twelve months, and a grammar school for six months, though such schools might be held in any number of places during the required time. Towns of 200 families were to maintain both schools for an aggregate of twelve months. The old law had required a grammar school in every town of 100 families, while the new law freed 120 towns from the old obligation. In 1824 another law freed all but seven towns, all of them commercial towns, from the ancient obligation. With the rise of the privately endowed academy having a more modern course of study the old grammar schools died out, and in many towns almost faded from memory.

All teachers in the higher schools were required by the law of 1789 to be college graduates, though, instead, a certificate from " a learned minister, well skilled in the Latin and Greek languages, settled in a town where the school are proposed to be kept," or from two equally well qualified ministers in near-by towns, would answer as well. Teachers in more elementary schools must also obtain a certificate, and the effects of the War of the Revolution are shown in the new requirement that only citizens of the United States could be employed as teachers, under penalty of a fine of 20*s*. a month. Ministers, selectmen, and other persons were enjoined to "use their best endeavors " that all should attend the schools, and the ministers and selectmen were appointed a visiting committee to look after the schools.

The decline in the desire for schools and learning, which set in in the eighteenth century, continued and became more marked, and the first fifty years of the existence of Massachusetts as a state was a period during which the town schools reached their lowest level. The moving school and the district system (*q.v.*) destroyed the efficiency of the common schools, and the rise of the academy undermined the old town grammar schools.

For the purpose of locating the districts in which the moving school should be held, the towns had been laid off into districts. By the law of 1789 the division into districts was legalized and the district system established, and in 1800 the power to levy a local tax was granted. This meant the breaking up of the town into school districts, each with its own school, or fraction of a moving school. With the disintegration of the towns the old grammar schools disappeared. In 1817 these school districts were given full corporate powers, and in 1827 the full culmination of the district system was reached when the towns were required to appoint a prudential committeeman for each school district to care for the school property of the district and to select and appoint the teacher for the school. Towns might allow districts to select their own committeemen, and this procedure was the one usually followed. As Mr. Martin has so well expressed it, "the year 1827 marks the high-water mark of modern democracy, and the low-water mark of the Massachusetts public school system." Horace Mann termed this legislation the most unfortunate ever enacted for the schools of Massachusetts.

The first of the endowed academies was opened in Newbury in 1763. William Dummer, dying in Boston in 1761, left his mansion house and farm at Newbury to found and endow a school, to be maintained on the estate. In 1782 its name was changed to Dummer Academy. In 1778 Phillips Academy was established at Andover; in 1784 Leicester Academy was founded; and in rapid succession other academies were opened at Derby, Bristol, Marblehead, Westford, Westfield, Plymouth, and New Salem. To three of these state aid was granted in the form of Maine lands. Numbers of petitions for similar aid and charters now came in, and in 1797 a legislative committee was appointed to determine the future policy of the state toward these institutions. The report favored the continuance of the policy of aiding, by means of grants of land, these privately endowed academies, and by 1840 as many as 112 acts of incorporation had been granted for academies to be located in eighty-eight towns, and in every county of the state. These institutions were intended to prepare boys for the colleges. Their curriculum was more modern than the old grammar schools had provided, and many able students were attracted to them. A few took first rank; many others possessed only a local reputation. They upheld a higher standard of education and teaching than the grammar schools had done. Under their influence Harvard College was able materially to increase its entrance requirements. On the other hand, the academies fostered the idea of private education, and thus acted injuriously on the public school idea. The wealthier patronized the tuition schools, and the poorer were left to get what they could from the free town schools. The limited and inefficient town schools led to the founding and endowing of the academies, and the more the academies succeeded and prospered, the poorer the town schools became. At about the same time that the district system became supreme the academies reached their greatest development. These were dark days for the public school idea. Boston made the beginnings of a new movement by the establishment of the English High School in 1821, the first public high school in America; a high school for girls in 1825; and the first evening high school in 1836.

Against this condition of apathy and indifference a number of public-spirited men began an energetic campaign. Mr. James G. Carter (*q.v.*) was the leader of the movement. Beginning in 1820, as a young college graduate, he devoted his energies for seventeen years to the building up of a sentiment for public education which finally culminated in the establishment of the Massachusetts Board of Education in 1837. With his voice and his pen he depicted the low state of education in Massachusetts, and aroused the state to action. Largely as a result of his efforts a number of laws of the first importance were soon enacted.

The first was a law which put a slight check on the district system, by differentiating school interests and instituting supervision. The law of 1789 had first required a form of supervision, through the medium of the ministers and the selectmen, or by a committee especially chosen for the purpose. Many towns took advantage of this and appointed school committees. School committee records in Newburyport date back to 1790; in Boston to 1792, and in Hingham to 1794. A law passed in 1826 made the appointment of a school committee compulsory, and gave to them charge and superintendence of the schools of the town. They could also determine the textbooks to be used, and were to examine and certificate all teachers. The districts objected most vigorously to this law, and the next year it was so modified as to virtually nullify it in many towns.

In 1827 another new law was passed, which, for the first time in the history of the state, made the entire support of the schools by taxation compulsory. Since 1647 support by taxation had been permissive and voluntary, and the schools of many towns had been so supported. In others fees had been charged, rate bills levied, voluntary contributions made, and various forms of maintenance employed. The law of 1827 made taxation compulsory on all towns, and put into effect, after 180 years, the principles enunciated in the law of 1647.

In 1834 another bill of importance provided for the creation of a school fund, not to exceed one million of dollars. The Maine lands were to be the chief source of the fund, and, profiting by the experience of New York and Connecticut, the distribution of the income of the fund to the towns was made contingent on the raising by the towns of at least $1 for each child of school age (four to sixteen years) and in addition making the school returns required by law.

In 1836 the first law relating to child labor was enacted. By it the employment of children under fifteen years of age was forbidden, unless they had attended school for three months during the school year.

In 1837 the act of the greatest importance of all was passed, creating the Massachusetts State Board of Education, to be composed of the Governor, Lieutenant Governor, and eight members to be appointed by the Governor, for eight-year terms, one to retire each year. They were to choose as their executive officer a secretary, and it was made his duty "to collect information of the actual condition and efficiency of the common schools and other means of popular education; and to diffuse as widely as possible throughout every part of the commonwealth, information of the most approved and suitable methods of arranging the studies and of conducting the education of the young." The board was without authority to enforce. Its work was to study conditions, publish results, and to persuade communities to take proper action. It was also to appoint assistants to the Secretary, known as agents, who were to travel about the state studying conditions. At one time the board had six of these in the field, examining schools, advising committees, and stimulating communities to action.

On June 29, 1837, Horace Mann (*q.v.*) was elected as the first secretary, and was reëlected annually for twelve years. With him began the great revival in education, not only in Massachusetts, but in New England, and its influence was felt in every Northern state. The history of this important period is largely the history of the work of Horace Mann himself. A new school system was created by his efforts; uniformity was introduced; a new interest in public education was awakened; and the new system virtually created was accepted by the legislature and the people, and has continued and developed ever since. The influence of his work extended to every Northern state, and the period of his labors is known in history as that of the great educational revival.

In 1838 the first public normal schools in the United States were established, partly by the legislature and partly by private support, two being opened at Barre and Lexington in 1839, and a third at Plymouth in 1840. In 1842 these schools were definitely adopted by the state and named state normal schools. A fourth state normal school was established at Salem in 1854; a state normal art school at Boston in 1870; a sixth normal school at Worcester in 1874; and four additional schools were established in 1894. In 1847 the Lyman Industrial School for boys was established at Westborough, and in 1856 a similar school for girls was established at Lancaster. In 1847 the legislature authorized the towns to provide supplementary schools for adults, and ten years later such schools were made an integral part of the school system. In 1883 the support of such schools was made compulsory on all towns having a population of 10,000 or over, and in 1886 the support of an evening high school was also made compulsory on all towns of 50,000 inhabitants or over. In 1848 state grants of aid for teachers' associations were made for the first time.

In 1850 the first truancy law was enacted, the towns being permitted to enact by-laws to remedy the evil. As this proved ineffective, and as the number of persons in the state who could not read and write was rapidly increasing, due to foreign immigration, and as such persons have always been looked upon with distrust by the state, the legislature enacted, in 1852, the first compulsory attendance law in the Union. By the terms of this law parents were required to send all children between eight and fourteen to school for at least twelve weeks each year, unless excused from attendance on account of poverty, or because otherwise instructed. The school committee was to notify the town treasurer of violations, and he was to enforce the law. The exemptions and indirect provisions for enforcement practically nullified the law. In 1862 the towns were required to make by-laws against truancy, and in 1873 they were also required to appoint truant officers, and the appointment was given to the school committee instead of to the town authorities. Later the twelve weeks were changed to twenty weeks, and then to thirty weeks, and in 1898 all children seven to fourteen years of age were required to attend school during all of the time the public schools are in session. The poverty excuse was removed, and, later, the option of attending private schools was to be allowed only after the private schools had been approved by the school authorities.

In the early fifties a strong demand was made by the churches, in a number of states, for a division of the school money; and in 1853 the demand was made in Massachusetts. Not only was the demand refused, but the legislatures of 1854 and 1855 in succession approved of an amendment to the state constitution forever prohibiting such a division of funds. This was ratified at once by the people, and at the same time the daily reading of the English Bible in the schools, which up to this time had been voluntary, was made compulsory. Subsequent acts have so modified the law that the children of parents who object may be exempted from attendance.

The first superintendent of schools in Massachusetts was employed by Springfield in 1840; but it was not until after Boston, in 1861, employed a superintendent that supervision became an important feature of the school system of the state. The commercial and manufacturing cities adopted the idea first, and from these centers it has extended to the whole state, — every child and teacher in the state now having the benefit of close and professional supervision. In 1888 the union of towns to employ a superintendent of schools was authorized, and the plan of aiding small towns to employ a superintendent of schools was begun, and in 1900 the formation of unions and the employment of a superintendent was made compulsory on all towns after July 1, 1902. Aid was also given to the poorer unions for the salaries of their teachers, where a superintendent is employed and receives state aid.

The law of 1647 had required instruction in reading and writing, and to this the law of 1789 had added English language, orthography, arithmetic, and decent behavior. In 1826 geography was added, and in 1857 the history of the United States. In 1858 drawing was made an optional subject, and in 1870 it was added to the list of regular studies. In 1885 instruction in temperance physiology and hygiene was added to the list, and in 1908 instruction as to tuberculosis and its prevention. In 1869 the consolidation of schools was authorized, and much has been done since 1885 in this work. In 1872 towns were authorized to support free industrial schools, but little was done in this direction until quite recently. In 1873 towns were permitted to furnish free textbooks and supplies to pupils, and in 1884 this was made a compulsory requirement. In 1893 school committees were authorized to provide evening lectures. In 1894 every town of 20,000 inhabitants was required to provide instruction in manual training as a regular part of its course of instruction. In the same year a law was passed providing for the inauguration of a state system of examination and certification of teachers, but no appropriation to carry the law into effect was made, and after remaining a dead letter for a number of years, it was repealed. In 1895 a high school tuition law was passed by which small towns were to be reimbursed for all or part of the tuition paid for the attendance of their pupils in other towns, and in 1898 the high school law was reënacted and made quite definite in the matter of its requirements on the towns. In 1898 the term of school required of small towns was increased from six to eight months. In 1899 the support of vacation schools was authorized. In 1906 the State Board of Education was directed to establish a state registry bureau for the employment of teachers. Medical inspection, made permissive at first, was required of cities and towns in 1906, the bill requiring the appointment of school physicians in each town or city, and making an annual examination of each school child compulsory. In 1908 an act was passed requiring all towns of over 10,000 inhabitants, not provided with proper playgrounds, to vote at the next election on the question of providing such. One playground was required for the first 10,000 inhabitants, and one for every additional 20,000. Of the twenty-five cities voting, twenty-three accepted the law. In 1908 a law authorized cities and towns to establish a pension law.

In 1905, on the recommendation of Governor Douglas, a Commission on Technical and Industrial Education was appointed. This commission made a very valuable report in 1906, and among other things recommended the creation of a Commission on Industrial Education of five to consider and plan for a comprehensive system of industrial and technical education for the state. This was done, the commission being created for three years, and being independent of the State Board of Education. In 1909 the legislature reconstructed the State Board of Education by abolishing both it and the Industrial Commission, and creating a new State Board of Education to consist of one member of the Industrial Commission, four members of the old state board, and four additional members, all to be appointed by the Governor and to serve for three-year terms, after the first appointments, to secure a retiring one third each year. The appointments were made during the early part of 1909, and the old State Board of Education, created in 1837, gave way to a new and a somewhat similar body, created to secure greater initiative and a more progressive policy. The old office of Secretary was abolished, and a Commissioner of Education was appointed instead. This is the most important change made in the Massachusetts school system in decades.

Present School System. — The new State Board of Education, created by the act of 1909, appoints as its executive officer a Commissioner of Education, and two Deputy Commissioners. The Commissioner is appointed for five-year terms, but may be removed from office at any time by a two-thirds vote of the Board. The board is free to go anywhere to secure these men.

The State Board of Education acts as a trustee for any funds created or donated for educational purposes; has control of the distribution of the income from the school fund to the towns, subject to the authority of the legislature; has charge and supervision of the normal schools of the state, acting as a board of regents, or trustees, for the ten schools; prescribes the form of all census returns, registers, and reports; requires all public schools, and all private schools, reform schools, and almshouses to report to it in full each year as to their work and finances; has charge of the education of the deaf and blind of the state in institutions; since 1906 has conducted a teachers' registry bureau; arranges for teachers' institutes, and grants state aid to those properly organized; approves (certificates) superintendents of schools for such supervisory unions as receive state aid; and may form and readjust such unions so as to provide supervision for stranded towns. Succeeding to the powers of the Industrial Commission, it will have power to investigate the need for and to extend industrial education; to provide lectures on the subject; to visit and report on all such schools; to initiate and superintend the establishment and maintenance of such schools, with the coöperation and consent of the municipality involved; and to expend all state money appropriated for the purpose of aiding such schools. The board is required to make a detailed annual report to the legislature, showing the condition of education in the state and the work done by it and its executive officers. The seventy-five annual reports so far made by the board are of very great value, and might serve as models for other states. The board possesses little real power or authority, and most of its acts in the past have been performed through its secretary, or its agents. This will doubtless continue to be the case with the new board and its commissioners.

Each city and town has control of the schools within its boundaries. Cities, except as provided in their charters, operate under the general school law. A school committee, elected by the city or town, has charge of the schools in each. A number of cities operate under special charters or laws, and have different forms of organization, but all conform to the general school law in most particulars. (See articles on BOSTON; CAMBRIDGE.) Each city or town is free to outline and prescribe its own studies, there being no state course of study or state requirements beyond the list of statutory school subjects and certain requirements as to types of schools which must be maintained by the larger towns. Each city or town of 10,000 inhabitants must provide evening schools for the instruction of those over fourteen years of age; every city or town of 20,000 inhabitants must provide instruction in manual training, as a part of its elementary and high school courses; every city and town of 50,000 inhabitants must provide an evening high school, if there are fifty children over fourteen years of age desiring to attend; every town of 500 families must maintain a four years' high school for forty weeks each year; and every town of less than 500 families must either maintain such a school or provide free tuition in the high school of some neighboring town. Other cities and towns may provide such instruction, and any town may provide playgrounds, vacation schools, evening schools, evening lectures, kindergartens, and instruction in agriculture, sewing, and cooking.

Each town school committee is to have full charge of the schools under its jurisdiction; must appoint a secretary; selects and examines teachers for the schools, but may accept Massachusetts state normal school diplomas in lieu of an examination; may dismiss teachers, as it deems best, and, after one year of service in the city or town, may employ them at its pleasure; may consolidate the schools and transport the pupils at public expense; must prescribe the course of study and the textbooks to be used and must furnish textbooks and supplies free to all pupils in all the schools; may supervise and control all athletic organizations in connection with the schools; and may employ a superintendent of schools. Two or more towns may unite to form a supervisory union and employ a superintendent, for one-year terms. If such a union raised $750 above the average paid during the past three years for the salary of the superintendent, the state will grant an additional $750 for the same purpose, and in addition $500 to increase the salaries of the teachers within the union. Towns having a valuation of over $2,500,000 cannot share in these benefits. Such unions must last at least three years, and at the time of formation the aggregate number of teachers should not be less than twenty-five nor more than fifty.

Every town must provide a sufficient number of schoolhouses, and for failure to do so a fine of from $500 to $1000 may be exacted; and if a town fails or refuses to raise money for the support of schools it may be fined twice the highest amount ever before raised for schools. Three fourths of such fines shall go to the town paying it, to be used for schools, while the remaining one fourth is to be forfeited to the county and to be used for county purposes. All teachers must keep a state school register, and the secretary of each school committee must make the proper returns, including a school census of all children five to fifteen years of age; and towns failing to report may be fined from 10 per cent to 100 per cent of their share in the school fund, or, if not entitled to a share of the school fund, may be fined $200, the income from such fines to be added to the principal of the state school fund.

All schools must be kept equally open to all children, without reference to race, color, or religion. Vaccination must be insisted upon by the towns. Every city or town must appoint one or more physicians for medical inspection, and provide them with proper facilities for their work. Pupils, janitors, teachers, and buildings must be examined. In cities this may be done by the Board of Health. Sick children must be sent home, and both the parents and the Board of Health notified. Tests of sight and hearing must be made at least once each year, the State Board of Health prescribing the nature of the tests and furnishing the material for the tests to the teachers.

The Massachusetts system of school management is peculiar among the states. Much is left to the towns, and little has been given to the central authority. Only within recent years has the state shown a tendency to increase the power of the central authority and to make prescriptions in its laws. The state oversight has been that of advice rather than direction, suggestion rather than compulsion. School legislation in Massachusetts has been characterized by an exceeding tenderness for the feelings of the towns, and the intense individuality of the towns and cities has been unduly considered and respected. As a result a diversity of practices is still retained, such as varying fiscal years, and different methods of calculating the cost of the schools, such as would not be permitted in any state west of the Alleghany Mountains. Nearly all progressive legislation has had to go through certain stages in its evolution. The first has been the permissive, or voluntary stage, marked by an adoption of the measure by the more progressive cities and towns, and a determined resistance to it by a residue of rather unyielding conservatism. Finally, after a long and rather slow process of education, the legislature has been induced to order the resisting towns to comply. This is in part made necessary by the peculiar methods of school support in use in the state. Not, for example, until all but forty-seven towns had voluntarily extended their schools to eight, nine, and ten months, did the legislature pass the eight-month school bill. Not until all but thirty-nine towns had voluntarily abandoned the district system, did the legislature finally abolish it. Educational progress in Massachusetts is a process of the education of the people; results are reached somewhat slowly, but they are likely to be permanent when finally attained.

School Support. — The state school fund, created in 1834, has been slowly increased until it reached the sum of $5,000,000 in 1908. In 1894, when the principal of the fund was $3,770,548, the legislature directed that $100,000 be added from the general treasury each year until the fund reached $5,000,000. Being one of the original states, Massachusetts never received any school lands from Congress, and the Surplus Revenue of 1837 given to it was spent for general purposes by the state. The income from the present fund, which is about $220,000 at present each year, is distributed only to the smaller and poorer towns, all towns having an assessed valuation of over $2,500,000 being deprived of any share in the fund. The basis of distribution is a combined and a sliding one, varying with both the assessed wealth of the town and the percentage of the town's taxes spent for schools. The state also makes certain small appropriations for superintendents' salaries (mentioned above), and for high school tuition and teachers' institutes. All of these, together with the income from the state school fund, constitute 2.18 per cent of the total expense for education in the state. Certain local funds, tuition charges, and gifts constituted 3.43 per cent more, and the remainder, 94.39 per cent, comes from local taxation. In the cities and the larger towns, the entire income for schools comes from local taxation alone. Massachusetts stands almost alone in this particular, and the burden of local taxation and the resulting school facilities provided exhibit very great inequalities. What some towns can provide with ease, others can provide only with the greatest effort, and still others cannot provide at all and never will be able to provide.

The total amount expended for education during the last year for which reports are available (1910) was approximately $20,000,000. Based on the total population of the state, this was equal to a per capita expenditure of about $6 a year as against $5.54 for the North Atlantic division, and $4.27 for the country as a whole.

Educational Conditions. — Of the population of 1910, 98.8 per cent were white, and but 1.2 per cent colored; 69.8 per cent were native born, and 30.2 per cent foreign born; 22.2 per cent were estimated as being between the ages of five and eighteen; and but 48.7 per cent were males. While the population averaged over the state is dense (418.8 per square mile), many towns have but a small population. Only 7.2 per cent of the total population live in country districts, and 80 per cent live in cities of 8000 or over. The state is essentially a commercial and a manufacturing state, with many important manufacturing towns.

In material conditions the schools of the state make an excellent showing. Most of the city school buildings are among the best of their kind, and the average value of all the school buildings of the state was a little over $15,000 in 1910. Of the total expenditures each year for education, only about 60 per cent is spent for salaries, about 21 per cent being spent for new and better school buildings.

In instruction the schools offer much that is commendable. Manual training is taught in all but the smaller towns. Domestic science is to be found in the curriculum of most of the cities and many of the towns. Agricultural instruction is offered in a few places. Drawing, long a required subject, has been carefully supervised by the state since 1871, and excellent work has been done in the subject. Textbooks and supplies are furnished free in all schools. Medical inspection is general. Kindergartens, evening high schools, evening drawing and technical schools, public playgrounds, and vacation schools are maintained by the larger cities and towns. A few industrial schools have also been established recently.

The state presents many educational inequalities, due to the great inequalities of the towns in taxing power. In some of the smaller and poorer towns the schools naturally are far below the standard of the schools elsewhere in the state, and below what schools anywhere ought to be. As some of the towns are steadily growing poorer while the cost of education is constantly increasing, this will always be so so long as the state insists on each town carrying so largely the burden of local support. While the enlarged school fund has been of much service to the poor towns, there is still need of further aid looking toward a much greater equalization of the burdens and the advantages of education. As it is to-day, good schools not infrequently go with the lighter tax and poor schools with the heavier tax.

The average length of term provided in Massachusetts was 170 days in 1910, and in but a very few cases fell below 160 days. The larger towns and cities provide approximately 200 days of school. In the matter of school attendance the state is very strict. Every child seven to fourteen years of age, and every child under sixteen years of age who cannot read and write, must attend some school, taught in the English language, every day it is in session. If the child is absent five days in six months, without proper excuse, parents may be fined $20. A private school may be approved for attendance only if it teaches all of the required studies and in the English language, and if the school committee is satisfied that it is as thorough and efficient as the public school. The bad physical condition of the child is not accepted as an excuse, unless efforts are being made or have been made to cure the child. Every town and city must appoint truant officers, though two or more towns may unite in making such an appointment. These officers may apprehend children without a warrant, and take them to school. Each county, either by itself or in union with another county, is required to maintain a County Training (Truant) School, for the confinement of habitual truants, absentees, and school offenders. Vicious inmates may be sent to the Lyman School for boys, if under fifteen, or to the Massachusetts Reformatory for boys, if over fifteen. Girls may be sent to the State Industrial School for Girls. Parents, if able, may be compelled to pay for the support of such children while in the schools.

The state is equally vigilant in the matter of child labor. No child under fourteen can be employed in any kind of labor during the hours that the public schools are in session, nor at other times before 6 A.M. or after 7 P.M. Saturday work in mercantile establishments is allowed. No child under sixteen can be employed without a work certificate, to be issued by the school authorities, and only to the proper persons. To be eligible, all such persons under the age of sixteen must be able to read and write the English language, the standard for this test being that of admission to the fourth grade of the public schools. Every factory employing such children must keep the work certificates on file and keep a list of such children posted in the factory. Factory inspectors and truant officers are to seek out all cases of illegal employment and good fines are inflicted for violation of the law. All illiterate minors over sixteen must attend evening schools, and a record of attendance must be filed each week with the employer. Towns may license bootblacks and other occupations in which minors engage, and may control the admission of children to places of amusement. These laws have been made necessary by the great influx of uneducated foreigners into the mill towns and manufacturing cities of the state. The illiteracy among the native whites was but 0.8 per cent in 1910; but among the foreign whites it was 14.6 per cent, while for the state as a whole the average was 5.9 per cent.

The development of the private and parochial school in Massachusetts has been one of the marked features of the school work of the state during recent years. Nowhere are the parochial schools better organized or stronger than in southern New England, and the Roman Catholic Church has there made a strong effort to gather the children of the foreign immigrants into its parochial schools, so long as it is able to provide for them. The fact that Massachusetts has better attendance laws than most states, and insists upon all schools being taught in the English language, and upon private schools being as good as public schools, is largely because of this condition.

Teachers and Training. — The state employed 15,278 teachers in 1910, 92.3 per cent of whom were women. Of this number, 13.7 per cent were graduates of colleges, and 50.4 per cent were graduates of normal schools. Of the total number of teachers employed, 14.3 per cent were in high schools, and 9.7 per cent in evening schools.

The certification of teachers is still in the hands of the town school committees, except that the legislature of 1911 provided for the certification of teachers in state-aided high schools by the State Board of Education. In the larger cities and in some of the towns, this is done in a very satisfactory manner, in many towns it is done only indifferently, and, in a few towns, according to reports made in recent years, the examination of teachers is conducted in a very perfunctory manner or neglected entirely. The law demands that the school committee "shall require full and satisfactory evidence" of the moral character of teachers, and "shall ascertain, by personal examination, their qualifications for teaching and their capacity for the government of schools." Massachusetts normal school diplomas may be accepted in place of an examination. The law is so lax that the way is open for any form of abuse, and no general certification standards are possible under it. Only in the larger cities and towns do any real standards exist. No other form of certificates are issued, except by the larger cities, and no provisions exist in the law for the recognition of any form of certification from outside the state.

The state maintains nine normal schools, as follows: Bridgewater, Fitchburg, Framingham (formerly at Lexington), Hyannis, Lowell, North Adams, Salem, Westfield (formerly at Barre), and Worcester. In addition, the state also maintains the Boston Normal Art School. The cities of Boston and Lowell also maintain city normal schools. All of these schools rest upon the high schools in the matter of admission requirements.

Secondary Education. — There were 230 public high schools in the state in 1910, employing 2210 teachers and enrolling about 55,000 students. Boston maintains fourteen day and six evening high schools, and Boston, Cambridge, and Springfield maintain technical high schools in addition to the regular type of high schools. Besides the public high schools, there were ninety-one private high schools employing 725 teachers and enrolling approximately 6400 students.

All cities and towns of 500 families are required to maintain a high school, and all towns of less than 500 families are required to provide high school tuition for their pupils in neighboring high schools. If the valuation of the town is less than $750,000, the state reimburses the town for all of the tuition paid; and, if over $750,000, the state pays one half. In 1910 the state granted aid to ninety-seven towns for 1114 pupils, at a total cost of $38,808.43. If any town of less than 500 families maintains a high school, the state grants it $500 in aid (forty-four towns in 1908). All high schools must have a four-year course, and be maintained forty weeks each year. Two adjacent towns, each having less than 500 families, may vote to unite to form a union high school. The work done in the high schools of the state is of good grade, and the standards maintained by the Massachusetts colleges insure a good quality of work along traditional lines.

Higher and Technical Work. — The Massachusetts Agricultural College, at Amherst, opened in 1867, is the only institution of higher learning maintained by the state. It offers courses only in agriculture, and enrolls about 250 students, practically all men. There has been agitation in Massachusetts within recent years looking toward the establishment of a state university, but the large cost seems to be a strong factor against the plan. For some years the state has provided forty scholarships for boys in the Massachusetts Institute of Technology and a like number in the Worcester Polytechnic Institute, and an alternative proposition has been made to increase these. So great has been the demand for these scholarships that the state has for a number of years divided most of them into half scholarships, and the number has been increased recently. The legislature of 1911 voted $100,000 annually for ten years to the Massachusetts Institute of Technology in return for free scholarships. Harvard University was originally founded by the colony, and for 150 years was, in part, supported by it, but it is no longer connected with the state. Until after the Revolution, money for the salaries of the faculty was voted annually by the General Court, and the election of president and professors was under its jurisdiction, and until 1865 the chief officers of the commonwealth were members of the governing board of the university. Since 1865 all connection with the state has been severed. The State Board of Education was instructed by the legislature in 1911 to consider the whole question of state-aided higher education, and to report its findings at a subsequent session.

The different institutions of higher learning in the state, not including strictly professional schools, are : —

Institution	Location	Opened	Control	For
Harvard University	Cambridge	1638	Nonsect.	Men
Williams College	Williamstown	1793	Nonsect.	Men
Amherst College	Amherst	1821	Nonsect.	Men
Mount Holyoke College	South Hadley	1837	Nonsect.	Women
College of the Holy Cross	Worcester	1843	R.C.	Men
Lasell Seminary	Auburndale	1851	Nonsect.	Women
Tufts College	Tufts College	1854	Nonsect.	Both sexes
Massachusetts Institute of Technology	Boston	1865	Nonsect.	Both sexes
Massachusetts Agricultural College	Amherst	1867	State	Both sexes
Worcester Polytechnic Institute	Worcester	1868	Nonsect.	Men
Boston University	Boston	1873	M.E.	Both sexes
Smith College	Northampton	1875	Nonsect.	Women
Wellesley College	Wellesley	1875	Nonsect.	Women
Radcliffe College	Cambridge	1879	Nonsect.	Women
Clark University	Worcester	1889	Nonsect.	Both sexes
Simmons College	Boston	1902	Nonsect.	Both sexes

Special Institutions. — The commonwealth provides for the education of children whose physical or mental defects forbid their attendance upon the public day schools, by giving the Governor power, on the recommendation of the State Board of Education, to place all such defective children in special institutions and to pay part or all of the expense of their maintenance and instruction. Such children are under the care of the State Board of Education until discharged. The institutions approved are: —

The American School for the Deaf, at Hartford, Connecticut.
*The Clark School for the Deaf, at Northampton.
The Horace Mann School for the Deaf, at Boston.
The Sarah Fuller Home for Little Deaf Children, at Medford.
* The New England Industrial School for Deaf Mutes, at Beverly.
The Boston School for the Deaf, at Randolph.
*The Perkins Institute and Massachusetts School for the Blind, at Boston.
*The Massachusetts School for the Feeble Minded, at Waltham.
The Boston Nursery for Blind Babies, at Roxbury.

(Those prefixed by * are maintained by the state.)

The state also maintains an Industrial School for Girls, at Lancaster, the Lyman Industrial School for Boys, at Westboro, and a Reformatory School for Boys at Shirley. The state also assists in the maintenance of large and well equipped textile schools at New Bedford and Lowell, and the law creating the Industrial Commission in 1906 provided for state aid to any town or towns of from one fifth to one half of the total cost of maintenance for industrial schools for the instruction of children over fourteen years of age in the principles of agriculture and domestic and mechanical arts. The law also provides for a Board of Commissioners of three, to be appointed by the Governor, who are to maintain, from state appropriations, the Massachusetts Nautical Training School, to provide a ship and all necessary books and materials, and to arrange for a six months' cruise each year in or near Boston Bay.

E. P. C.

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MASSACHUSETTS TEACHER.— See Journalism, Educational.

MASTER or MAGISTER. — The word appears to mean nothing more than chief (Magis-ter), and the original sense of the word appears to be best preserved in such phrases as "master-cook," "master-mason," and the like. Perhaps its earliest use is in the title of the *Magister equitum*, or "master of the horse," the chief of the cavalry, appointed by the Roman dictator as *magister populi*, or chief of the whole people. In this sense it was always used as it is used to-day.

But already in classical times it had acquired a special connotation as meaning schoolmaster or teacher. Cicero in the *De Oratore* not only speaks of masters *simpliciter* — to mean teachers of boys, but also uses the medieval sounding phrase "masters of the liberal arts." Juvenal uses *ludimagister* and *magister* as equivalent terms. In medieval times this became its general and almost exclusive use, and from this use it had developed into a title of honor, which has now become our universal "mister" so universal that there is no one probably to whom it is not applied, except to a criminal in the dock. Alcuin in his poem, *c.* 770, *On the Bishops and Saints of the Church of York*, in his catalogue of the Library speaks of "Beda magister," "Beda the master," or "Master Bede," as if it was as much his recognized title, derived from his office of teaching the young monks, as in later days the "Venerable Bede," became. Alcuin also describes his own master Albert as having been made proclaimed "master in the city," when he was made master of the school of York. It is probably from the date of the rise of universities at the end of the eleventh and the early part of the twelfth centuries, from *c.* 1090 and perhaps first in connection with the Doctor of Laws at Bologna that the term *Magister* becomes used as a regular title; Magister Inerius, Magister Abelardus. It then became restricted, and from being used of any who taught school came to mean one who had taught school at one of the *Studia generalia*, a regent master of the schools of a university. At Bologna, however, the title "master," which was exactly equivalent to "doctor" or teacher, — Alcuin describes Egbert of York when teaching the school as *Egregius doctor*, — was dropped in the faculty of law for that of doctor. At Paris and Oxford, too, the title of "doctor," began to be more usually restricted to the theological masters, and at Salerno and elsewhere to the medical masters, by whom it has now in common parlance been almost entirely annexed. But in theory always there was no distinction, and the Master of Arts was the teacher and held the highest degree in his faculty as much as the Doctor of Theology in his. But as it became usual and eventually necessary to take the course in arts and become a regent master of arts before passing on to the faculty of theology, which was the mistress of all the sciences, it came about that in later days doctor was esteemed as a higher title.

Perhaps the most curious thing about it was that the title of *magister* among the ecclesiastics completely eclipsed the title of *dominus*, or lord, so that eventually those who had not "risen to the height of the mastership," but had stopped short as bachelors, — at first a kind of pupil teachers, a sort of apprentices in the arts and the art of teaching, — became known as *Domini* in distinction from those who had become regent masters; and shared the title with the "inferior clergy" who had never been to the University at all, and the lay lords of manors and of Parliament. The height of the title of master was perhaps reached when it was bestowed upon the simple layman, Thomas Cromwell, when he was Privy Seal, and "Prime Minister" in the State and wielded, as Vicar-General of Henry VIII, papal powers in the Church; in contrast with William of Wykeham, who, when he occupied a similar position under Edward III, is called by Froissart simply "Dominus," "Sir Wiccan." Its gradual spread to every one of any position at all was due to the rise of the middle classes and the increase in the numbers of the peerage, to the invention of the order of baronets by James I, and the increase of the knighthood. A. F. L.

The general usage was transferred to the American colonies, where the term was applied to both Latin grammar and elementary school teachers, the former at first termed masters and the latter school masters, though the distinction was not clear nor the usage fixed.

See Degrees; Teaching as a Profession; Universities.

MATERIALISM. — The theory that matter is the sole ultimate existence, and that all mental phenomena are in reality effects of matter, so that, if our knowledge of matter were complete, we could deduce from its laws and conditions so-called mental phenomena with the same certainty as phenomena of heat or electricity. The atomic school of antiquity represented by Democritus and Leucippus is generally regarded as the founder of philosophic materialism. These tenets were taken up by the Epicureans and find a classic expression in the *De Rerum Natura* of Lucretius. The atheistic character of this school brought materialism into ill repute, and among the many heresies of the Middle Ages few are frankly materialistic in character. The Epicureans, however, defended the liberty of the will, as they found it necessary to introduce chance and spontaneous variation of direction of motion into matter. Some of the modern materialists have been strong theists, as Joseph Priestley (*q.v.*).

The modern interest in the problem of knowledge and in consciousness (see Idealism) has tended to reduce the importance of materialism, if not actually to eliminate it. The objective idealist has claimed that "matter" itself is ultimately but a "category" of thought or spirit in its determination of an objectively knowable world. Subjective idealists have claimed that conscious facts are the only ones directly known, and that "matter" is at most but a dubious inference from mental phenomena. Others have claimed that the principles of the conservation of energy contradict materialism, since the circuit of transformations of energy is complete on the physical side alone. The seeming dependence of mental phenomena upon brain changes is in reality but the concomitance of two independent series — a doctrine that under the name of Parallelism (*q.v.*), has given a turn to the Leibnitzian conception of Preëstablished Harmony which has been very popular. Others, like Spencer and Huxley, have held that from one point of view mental phenomena are resolvable into physical; from another, physical into mental. Hence, the conclusion that both series are but symbolic manifestations of some ultimate unknown and unknowable reality. Even those writers, who, like Haeckel, have more openly maintained a materialistic monism, have generally endowed "matter" with some primitive inchoate psychical impulses and feelings and have thus approximated panpsychism or the doctrine that the world and mind are both arrangements of a more basic "mind stuff." J. D.

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MATERNITY. — See Parenthood, Education for.

MATHEMATICS. — Attempts to define so broad a subject as mathematics have not been very successful. Benjamin Peirce, one of the best of the American-trained mathematicians, said that "mathematics is the science that draws necessary conclusions." Such a definition trespasses upon the domain of logic; but there are many who would relate logic and mathematics, as sciences, more closely than is commonly done. Professor Bôcher has suggested a basis of definition: "We may seek some hidden resemblance in the various objects of mathematical investigation, and, having found an aspect common to them all, we may fix on this as the one true object of mathematical study. Or we may abandon the attempt to characterize mathematics by means of its *objects of study*, and seek in its *methods* its distinguishing characteristic. Finally there is the possibility of combining these two points of view." When, however, we attempt to define the science with respect to its objects, we are confronted by so many difficulties that there seems but little hope of success. There seems more chance of favorable results in attempting to define the science by means of methods, and numerous efforts in this direction have been made. Professor J. W. Young has recently suggested the defining of "abstract mathematical system" as a system of symbols devoid of content except such as is implied in the assumptions concerning them, and then saying that "mathematics as a whole might then be defined as consisting of all such abstract mathematical systems together with all their concrete applications." These attempts at defining the science serve at least to show the broadening of the subject from century to century.

With this broadening of the science itself has come not merely the difficulty of definition, but also the difficulty of stating in concise terms the certain reasons for studying the subject. We may set forth certain reasons for studying this phase or that, but for studying a science that is so broad that we can hardly define it, and so far-reaching in its applications, it is manifestly well-nigh impossible.

In the elementary portions of the general field it is possible to assign some reasons for studying the science. Among these, utility stands out prominently, and indeed there are few parts of mathematics that have not very definite applications to some other line of science or to some of the arts. Not only is there the definite application of the present to be considered, but there is potential application. No one thought when complex numbers were first suggested that they would in our day play a part in the theory of electricity, for example; nor did the Egyptians and Greeks see in their shadow reckoning the forerunner of the trigonometry that uses the slide rule and logarithms in its computations, as at present. Certain of the reasons for the study of mathematics are set forth under the various branches considered in this work.

There is no well-defined basis for the satisfactory classification of the branches of mathematics. Indeed, the modern tendency is toward the uniting of these branches rather than their differentiation. In elementary mathematics this tendency shows itself in the use of the simple equation and the introduction of mensuration in arithmetic; in the use of the facts of mensuration thus learned in algebra; in the use of algebra in the elementary course in geometry; and in the use of both algebra and geometry to a greater extent than formerly in trigonometry. Many would like to see the union of elementary mathematics made still more close, and it is probable that the interrelation of algebra and geometry will become more and more pronounced. D. E. S.

For a further study of the subject see the articles on the various branches of mathematics, including ALGEBRA, ANALYTIC GEOMETRY, ARITHMETIC, CALCULUS, ELEMENTARY MATHEMATICS, FUNCTION, GEOMETRY, TRIGONOMETRY.

MATHEMATICS, HISTORY OF. — See ALGEBRA; ANALYTIC GEOMETRY; ARITHMETIC; CALCULUS; COMPUTUS; CONICS; FRACTIONS; GEOMETRY; NOTATION; PROJECTIVE GEOMETRY; TRIGONOMETRY.

MATHEMATICS, LABORATORY METHODS IN. — At various times it has been sought to present elementary mathematics somewhat after the laboratory method of the natural and physical sciences. The movement has been fostered by those who see in algebra and geometry a powerful adjunct to physics, as well as by those who wish to make mathematics as concrete as possible. Within reasonable limits the spirit of such a movement is one that is approved by many teachers. Whenever it is possible to show the concrete applications of mathematics in such a way that the interest aroused thereby outweighs the loss in the theory that is occasioned by the time expended, the result is salutary. There have, however, been extremists who have abused the spirit of the movement, and have gone to the laboratory to illustrate, by tedious means, principles that are substantially axiomatic to the normal mind, thus sacrificing valuable time and even dulling the interest. This is seen in the laborious devices often employed for explaining the axioms of algebra, when a ruler balanced on a book answers the purposes much better. It is also seen in the great expenditure of time sometimes involved in graphic work that has little bearing upon the subject in hand, and particularly in the tendency that is sometimes observed to turn the class in mathematics into one in mechanics or general physics.

The result of the efforts has been valuable in the industrial schools, where the aim is not mathematics as a science, but the study of the relatively few types of application that are needed in the lower lines of mechanical work. Here the laboratory, with its practical measurements, its making of working drawings, and its use of such instruments as the slide rule, has a definite place. In the non-technical high school the spirit of the laboratory may profitably show itself in the use of concrete illustrations whenever such use elucidates the mathematical processes, and in making the subject as real as possible. But to devote any considerable amount of time to this effort has not, in general, been thought wise. There is a large field of pure mathematics that is and should be developed for its own sake, just as literature is developed, and it would be unfortunate to neglect this for the benefit of those who are abnormally unable to appreciate it.

The equipment for laboratory work includes drawing boards and instruments for graphic illustration and for the making of working drawings; the slide rule, logarithmic tables, and, if possible, one of the more elaborate forms of computing machines; measuring instruments, including calipers, scales for weight, diagonal scales, steel tapes, and units of capacity, in both the common and metric systems; sets of geometric solids; a transit and surveying rods; a blackboard ruled for coordinate graphs; a spherical blackboard, and similar material. Indeed, a considerable amount of this material should find place in every high school, even where the narrow type of laboratory work is introduced. D. E. S.

MATHER, INCREASE (1639–1723). — Sixth president of Harvard College. He was graduated from Harvard in 1656, and subsequently studied at Trinity College, Dublin, where he took his A.M. degree in 1658. Returning to America in 1661 he became pastor of a church in Boston. He became a stirring figure in the life of the colony, opposed the aggressions of King Charles II, and in 1688 was sent to England to procure redress of the grievances of the colony. He was acting president of Harvard in 1681 (after the death of President Oakes), but he declined at that time to become the permanent head of the institution. He succeeded President Rogers as president of Harvard on June 11, 1685, and held the post until Sept. 6, 1701. Through his efforts the college was authorized to create bachelors and doctors of theology. "As president he was careful not only to give the students direction in their literary pursuits, but also to impart to them religious instruction. He frequently called them one by one into the library, and there, with the affection of a parent and the fidelity of a minister of the gospel, he would confer with them respecting the salvation of their souls." It was largely through the efforts of Mather that the Presbyterian and Congregationalist bodies in New England were united. His writings include a history of the troubles of the English settlers with the Indians, and numerous religious works. W. S. M.

See HARVARD UNIVERSITY.

MATHEWS, JAMES MACFARLANE (1785–1870). — First chancellor of New York University. He was graduated from Union College in 1803, engaged in the work of the ministry, and was one of the leaders in the organization of New York University (then University of the City of New York) and its first president (1830–1838). He was the author of works on religion and travel. W. S. M.

MATURITY TESTS. — The difference between a child's general physiological development and his mental development has been emphasized by calling attention to the fact that the child's mental age may be different from his physiological age. In an extreme case an imbecile may be twelve years of age and yet have the mental development of a child of two years of age. In order to ascertain the degree of mental maturity which a child has attained, series of tests may be applied to discover his relative ability in visual recognition, in language, in imagination, in power to deal with numbers, etc. C. H. J.

See GROWTH; TESTS, PSYCHOPHYSICAL.

MAUGER, CLAUDIUS (*fl.* 1650). — Teacher of French in London, a native of Blois, who had left France on account of religious persecution. He was apparently a teacher in France before he came to England, and obtained a living in London by private and school teaching, particularly in the girls' school of Mrs. Margaret Kelvert. In 1652 he published the *True Advancement of the French Tongue*, and in 1656 he issued the second edition of a *French Grammar*, in which a Latin as well as an English version is given, that points to the probability that the first edition was a French-Latin work published in France with the English added for the second edition as published in London.

See MODERN LANGUAGES IN THE SCHOOLS.

MAURICE, JOHN FREDERICK DENISON (1805–1872). — Divine and educational reformer; born at Normanston, near Lowestoft, England, the fifth child of Michael Maurice, who at the time of his son's birth was educating private pupils at Normanston Manor House. Frederick was educated by his father in Puritan principles. He was a precocious child. Intended by his father for the Unitarian ministry, he revolted against Unitarianism and the narrow outlook of English nonconformist circles in his time. With a view to becoming a barrister he entered Trinity College, Cambridge, in 1823, that university being chosen as it imposed no religious test upon students at matriculation. At Cambridge, Maurice was one of the founders of the Apostles' Club, and became an intimate friend of John Sterling. While still at Cambridge he was coeditor of the *Metropolitan Quarterly Magazine*, in which he declared his admiration for Coleridge and attacked Bentham. In 1828 he joined the debating society founded by John Stuart Mill, MacCulloch, Charles Austin, Romilly, and others, and is mentioned by J. S. Mill (*Autobiography*, p. 128) as a Coleridgian, and, with Sterling, representative of "a second Liberal, and even Radical, Party, on totally different grounds from Benthamism and vehemently opposed to it, bringing into these discussions the general doctrines and modes of thought of the European reaction against the philosophy of the eighteenth century." This became Maurice's habitual standpoint. He was opposed both to the Benthamites and to the Tories. For a short period he was editor of the *Athe-*

næum. His mind gradually turned toward taking holy orders, and he resolved to go to Oxford, where he entered Exeter College in 1830. In 1831 he entered the Church of England. After a curacy near Leamington he became, in 1836, chaplain to Guy's Hospital, giving lectures to the students on moral philosophy twice a week. In 1837 he married the sister of Sterling's wife. In 1839 he became editor of the *Educational Magazine*, and delivered a course of lectures on the subject, *Has the State or the Church Power to educate the Nation?* In these lectures he protested against the theory that the secular State should take over the whole of national education out of the hands of the religious bodies. In 1840 Maurice was appointed Professor of English Literature and History at King's College, London, and in 1846, one of the professors in the theological department of the college and also chaplain of Lincoln's Inn. Among his congregation at the latter were Thomas Hughes (*q.v.*), J. M. Ludlow, and the nucleus of the Christian Socialist Party. They and Charles Kingsley (*q.v.*) became the devoted friends of Maurice. In 1844 he founded Queen's College, the first of the collegiate institutions in England for the higher education of women. He had been led to take an interest in this subject by the experience of his sister, Mary, who had established a school at Southampton. The profound movement in political and economic thought which stirred England and Europe from 1842 onwards led to the establishment (first in Sheffield, 1842) of people's colleges formed by the voluntary effort of workingmen students for self-improvement and instruction. The idea of the Sheffield People's College suggested to F. D. Maurice and his friends in 1853 the foundation of a similar institution in London, and this led to the establishment of the Working Men's College, the most famous and influential of all efforts to promote the higher education of working people. The founders of this college laid stress upon the need for brotherliness and fellowship in all higher education, upon the fact that in its true form such education is mutual education and that teachers and taught must meet as human beings, with full confidence in one another and without reserve. The first of the fundamental principles of the college ran as follows: "Our position as members of a society which affirms the operation of trade and industry to be under a moral law (a law concerning the relations of men to each other) obliges us to regard social, political, and human studies as the primary part of our education." The teaching staff of the Working Men's College included Ruskin, F. J. Furnivall, T. Hughes, Professor Westlake, Dante Gabriel Rossetti, Lowes Dickinson, E. Vansittart Neale, Grant Duff, Thomas Woolner, Charles Kingsley, Ford Madox Brown, Frederic Harrison, and Edward Bowen. The lectures which introduced the idea of the Working Men's College to the British public were subsequently published in 1855 by F. D. Maurice, under the title *Learning and Working.*

In 1853 a bitter theological controversy had severed Maurice's connection with King's College. In 1860 he was appointed to the charge of St. Peter's Chapel, Vere Street, London, and as a preacher had great influence on the most thoughtful men and women of his time. He died April 1, 1872, and is buried at Highgate.

Maurice is one of the most revered figures in the intellectual and spiritual life of England during the Victorian era. As to the validity and permanent significance of his contributions to the intellectual thought of his time opinions have always varied. A large circle found guidance in his teaching, ranking him with S. T. Coleridge among English thinkers. Frederic Harrison, on the other hand, and others inclining to the Positivist standpoint, speak of him as muddle-headed (see Frederic Harrison, *Autobiographic Memoirs*, 1911). From the educational point of view, Maurice's personal influence was of historic importance. He and his friends were the first to touch the older English universities with a sense of direct personal responsibility for the adult education of the working classes. M. E. S.

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MAURITIUS, EDUCATION IN. — The small island of Mauritius has been under British control for a century, having been acquired by conquest in 1810 and formally ceded to that power by the Treaty of Paris, 1814. The island, which has an area of 705 square miles, supports a population of 378,000; of this number two thirds are natives of African origin, Chinese, mixed peoples, and white settlers. In religion, according to the census of 1901, 206,000 were Hindus, and above 40,000 Mohammedans. The Roman Catholic Church claimed 113,224 and the Protestants, 6644. A dual system of free schools, government and denominational, is maintained, both aided from the public treasury. In the government schools 8634 pupils were enrolled in 1909, with an average attendance of 5433. In the state-aided denominational schools the enrollment was 10,631, and average attendance, 7234. Secondary and higher education are provided by the Royal College and its affiliated schools. The total government expenditure for education in 1909 was £40,394 ($196,315). A. T. S.

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MAXCY, JONATHAN (1768–1820). — College president. He was educated at Providence and engaged in the ministry of the Baptist Church. He was president of Brown University (1792–1802), Union College (1802–1804), and the College of South Carolina (1804–1820). He published several pamphlets on religious and educational subjects.

W. S. M.

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MAXIMUS PLEANDES. — A celebrated scholar and writer who lived in the fourteenth century. He was a Greek monk, and spent the greater part of his life at Constantinople, where he pursued the study of theology, rhetoric, history, mathematics, and poetry. Little is known of his history except that he was sent as an ambassador to Venice, and that he was still living in 1352. Numerous works of his are extant, one of the most important being a work on arithmetic, based on the Hindu numerals.

D. E. S.

MAY, SAMUEL JOSEPH (1797–1871). — Normal school principal. Graduating from Harvard College in 1817, he taught for many years in the schools of Massachusetts. He was principal of the Framingham (Mass.) State Normal School (1842–1845), and was active in the American Institute of Instruction (*q.v.*). His educational writings include *Education of the Faculties, Revival of Education,* and numerous articles in educational journals. W. S. M.

MAYNOOTH UNIVERSITY, DUBLIN. — See Ireland, Education in.

MAYO, AMORY DWIGHT (1823–1907). — Educational author. He studied at Deerfield Academy and Amherst College. After teaching in the public schools of Massachusetts for five years, he entered the ministry, and for twenty-five years was pastor of Universalist and Unitarian churches, and for several years lecturer at the Meadville Theological School. He led the so-called Christian amendment movement which sought to incorporate in the constitution of the United States the right to use the Bible in the public schools. From 1880 to 1885 he was one of the associate editors of the *New England Journal of Education,* and during his closing years was engaged by the Bureau of Education of the United States in the study of educational problems. His published writings include *Religion in the Common Schools* (1869), *Industrial Education in the South* (1885), and a series of articles on the history of American common schools, published in the annual *Reports* of the Commissioner of Education of the United States. W. S. M.

MAYO, CHARLES (1792–1846). — English educator, born in London and educated at Merchant Taylors' School and St. John's College, Oxford, where he graduated in 1814. He was ordained in 1817, when already headmaster of the grammar school at Bridgnorth, Shropshire. In 1819, whether it was through the influence of Mr. Synge of Glanmore Castle, Wicklow, or whether he was persuaded by friends to take charge of some English boys at Yverdun, he joined Pestalozzi's establishment as its chaplain. Here he remained until 1822, when he returned to England and opened a school on Pestalozzian principles at Epsom; soon after (1826) he removed to Cheam. His work was strongly imbued with an intense moral and religious purpose. He met with great success, and intending pupils were placed on the waiting list years before they could be admitted. Hermann Krüsi, Jr., taught here for a time. Through Mr. J. S. Reynolds, Mayo and his sister helped to found the Home and Colonial School Society (*q.v.*) and the training college for teachers connected with it. Mayo's great service to English education was to call attention to the Pestalozzian principles, although in introducing them generally to the schools he diverged widely from their spirit by formalizing them in model lessons and textbooks. He lectured on Pestalozzi before the Royal Institution in 1820 and collaborated with his sister in several schoolbooks and a memoir on Pestalozzi. Among his works may be mentioned *Observations on the Establishment and Direction of Infant Schools* (1827); *Practical Remarks on Early Education* (1837), frequently reprinted by the Home and Colonial School Society; a lecture on Pestalozzi's life prefixed to Miss Mayo's *Pestalozzi and his Principles.*

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MAYO, ELIZABETH (1793–1865). — English Pestalozzian, sister of Charles Mayo, whom she assisted from 1822 to 1834. In 1843 she became associated with the work of the Home and Colonial Society (*q.v.*), and had charge of the criticism and professional training at the society's training college, duties which she exercised with great skill. She collaborated with her brother in several Pestalozzian textbooks, which formalized and in a large measure stultified the spirit of the work. Her own works enjoyed great popularity, and include: *Lessons on Objects* (1831); *Lessons on Shells* (1832); *Lessons on Scripture Prints* (1840);

On Religious Instruction (1849); *Model Lessons for Infant Schools* (1848–1850).

See Mayo, Charles, and the references there given.

MEAN. — See Statistical Method.

MEANING. — This term has come into common use in psychology to refer to that phase of experience which goes beyond the impression. Thus, as one looks at a word, the impression consists of certain black and white spaces. The word, however, calls up a whole series of ideas which give meaning to the impression. The meaning which attaches to an experience may be more or less complex. Thus the meaning which the student of constitutional history attaches to the date 1776 and the meaning which a child in the elementary school attaches to the same date will differ vastly in complexity.

The term " meaning " serves one very important function in psychological discussions. It draws attention to the fact that the additions which we make to impressions are not commonly in the form of full explicit memory images. Thus, the first time that the child learns the meaning of the word " dog " he sees the animal, thus adding a visual image to the sound. The second time he may call up an image of the dog, or he may see a second animal to add to his interpreting experience. The third and fourth times his experience continues to develop, until finally the word " dog " has a very full significance. Psychological analysis of this last stage reveals the fact that the meaning added to the word is not a mere series of reproductions of that which the child saw the first, second, third, and subsequent times. It is rather an epitomized and thoroughly assimilated residuum of all that has gone before. It may contain very little visual imagery. It may be for the most part a thrill of friendly emotion with a vague visual or tactual image. In any case, the meaning is a digest of the experiences rather than a train of images.

Teachers who insist on too much memory work will find a corrective for their methods in a careful study of the psychology of meanings. C. H. J.

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MEASLES. — Measles is a highly contagious disease due, probably, to a bacillus hæmophilus similar to Pfeiffer's influenza bacillus. This bacillus is frequently found in the secretions of the conjunctiva, the nose, and the respiratory tract.

The initial symptoms are similar to those of a cold, and the characteristic symptoms are an eruption of small red spots especially on the forehead and the back of the neck, and in most cases a white spot, the so-called Koplic spot, on the mucous membrane of the inner surface of the mouth or on the conjunctiva. The disease usually remains at its height for a day or two and then gradually subsides, and, if there are no complications, in a fortnight or less, the patient has usually recovered. In many cases, however, serious complications, especially bronchitis, pneumonia, or tuberculosis, result. The period of incubation is from eight to sixteen days, sometimes still longer, and the patient may be a source of infection for other children three days before the disease can be diagnosed by ordinary methods. It is spread chiefly if not entirely by personal contact, apparently seldom if ever carried by a well person; only rarely does an individual have the disease twice. The eruption is probably due to the formation of antibodies in the organism to combat with the disease, a view in harmony with the popular idea that a generous breaking out is a good symptom.

In regard to the disease many erroneous ideas are prevalent. It is not ordinarily considered a serious disease; it is supposed that every one must have it, and apparently many think that the sooner a child has it, the better; and even physicians are apt to think it is uncontrollable. On the contrary, measles is often a fatal disease with young children. It is especially serious for weak and anæmic children, those who have latent tuberculosis, and those who have a tendency to certain diseases, such as disease of the ear, the heart, and the respiratory organs. According to Dr. Kerr, under whose supervision the extensive London investigations have been made, " measles is the most fatal disease of childhood and the one that plays the most havoc with school attendance" (Kerr. *Report of the Medical Officer*, London, 1905, p. 30). While not as serious in this country as in England, investigations in many countries have shown the great mortality where the disease occurs in the early years before the age of six. The total number of deaths from measles in the registration area covered by the U. S. Census for the year 1908 was 4611. In Prussia for the year 1906 it was 9107, and it is estimated that every year there are about 15,000 deaths from this disease in the United Kingdom.

The aim of hygiene is to postpone the disease to as late an age as possible. It should be kept out of the kindergarten at whatever cost to school work. The postponement of the disease even to the elementary grades means that a smaller number of children will have it at an early age. And the aim is also to make the time between epidemics as long as possible; for this again means that fewer young children will have the disease. In the view of some it is an uncontrollable disease, and thus we had better allow it to exist in chronic form than try to combat it and have periodic epidemics.

Modern studies, however, indicate that in the school at least it can be in large measure controlled.

The scientific method of managing measles based upon the facts just mentioned consists of four things: first, a complete registry of all cases kept by the board of health, so that as soon as a case occurs in any school it will be possible to see just how many of the children have already had the disease. Second, in case of a kindergarten or primary class where a considerable part of the children are susceptible, closure of the class when measles becomes epidemic in the city, whether a case has occurred in this particular kindergarten or not, or else notification of all parents warning them to watch their children carefully in case of colds or the like. Third, whenever a case of measles appears in a class, exclusion of all children of the same family who have not had the disease; and, eight days after the first case appears in any class, exclusion of those susceptible for a period of eight days so that the second crop of cases will occur while the children are at home, together with notification of all parents to watch their children. Fourth, careful instructions of both parents and teachers in regard to necessary precautions.

The great difficulty in treating measles is that of detecting the first case at a sufficiently early period to prevent infection. The success, however, of Dr. Eberstaller's method, and the probability that an earlier diagnosis of the disease will soon be possible, give good hope that soon it may be controlled at least to such an extent that it can be kept out of the kindergarten and the primary grades. The Koplic spots, although not present in all cases, are a sign of measles; and this often renders possible an earlier diagnosis than the general symptoms. Moreover, recent studies by Hecker show that there are important changes in the blood which perhaps will soon permit a diagnosis of the disease several days earlier than has hitherto been possible. Probably before the community is educated to the proper care as regards measles, it will be quite possible to diagnose the disease at the time when it first becomes contagious.

Children who have measles should be kept out of school for a period of three or four weeks, and brothers or sisters who have not had the disease should be excluded from school; but the consensus of the best authorities seems to be that it is an unnecessary and wasteful precaution to exclude other members of the family who have already had the disease. Frequently a great injustice is done in the higher classes by such unnecessary exclusion. School closure on account of measles is apt to occur after it becomes unnecessary and useless; for the children have been exposed to the disease, and the only good of closure is to appease the alarm of excited parents. Closure to be effective must occur when the first case occurs. Whenever a case of measles appears, whether the school be closed or not, parents of unprotected children should be notified.

The general adoption of a scientific method of managing measles would probably result in the saving of many lives, much chronic illness, and great interference with school work.

W. H. B.

See Contagious Diseases; Infectious Diseases; Medical Inspection.

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MEASURE. — See Musical Notation.

MEASUREMENT. — See Ability; Psychology, Experimental; Statistical Methods; Tests; Psychophysical.

MEASURES. — See Denominate Numbers; Metric System.

MECHANIC ARTS SCHOOLS. — A term of indefinite connotation, applied occasionally to institutions of technical or industrial education of higher or secondary grade. Its widest use was in the Morrill Act of 1862. For these institutions see Agricultural Education; Technical Education. It is also occasionally applied to Manual Training High Schools. See Manual Training.

MECHANICAL CALCULATION. — The methods of calculation by means of the Hindu-Arabic numerals taught in our schools to-day are comparatively modern, and are not as generally used throughout the world as is often supposed. Up to the sixteenth century calculations were performed mechanically by all peoples on some form of the abacus (*q.v.*); this was due to the fact that our present system of Hindu-Arabic numerals with its symbol for zero and the important feature known as *place value* had not been developed until this period.

Our present methods of written computation were not possible earlier, for they depend upon a more perfect notation than the Roman, such, for example, as the Hindu-Arabic. This situation is readily appreciated when one attempts to add a column of figures expressed in the Roman notation. The Romans never used their numerals for calculation, but merely to record results obtained mechanically on the abacus.

Though the sixteenth century developed this new method of computation, the majority of people continued to compute mechanically, and even to-day Japan, China, Russia, and a number of smaller countries do all computing on the *swanpan* or *soroban*, or on some similar form of abacus. In the banks in any of these countries one is surprised to find exchange computed as rapidly and accurately on these little counting frames as it would be by an expert accountant in this country.

During the last twenty-five years a part of the civilized world is rapidly returning to mechanical calculation, substituting for the abacus the modern calculating machine. This new development has gone so far in the United States that most large accounting rooms and banks are now using from one to two hundred such machines, and in some of the larger department stores all of the bookkeeping is done by machinery. Even the familiar cash register seen everywhere in small as well as large shops is, in addition to a money drawer, an adding machine which automatically adds the sales as they are made and gives a grand total at the end of the day.

Modern calculating machinery is divided into two large classes: (1) adding machines, and (2) multiplying and dividing machines. Adding machines are usually operated by keys like a typewriter; some of them, like the Burroughs Adding Machine, print each item added, while others, like the Comptometer, give only the results without printing. The latest development is a combination of the adding machine and the typewriter, an arrangement which makes possible a complete system of mechanical bookkeeping. The Elliott-Fisher is a representative machine of this type. All the machines above mentioned are used very extensively in banks and business houses.

Multiplying and dividing machines are divided into two classes: (1) those which multiply by continued addition, and (2) those which multiply directly. The former machine is the simpler and was originally conceived in 1668 by Leibnitz, the great mathematician. In its modern form it is known as the Thomas Arithmometer. The Unitas, the Brunsviga, and the Triumphator are other modern machines of this type. Of the machines which multiply directly the Millionaire is a representative. On all these machines, which are operated by hand or electricity, long multiplications and divisions are performed with absolute accuracy in a few seconds. These machines are extensively used by insurance companies and large manufacturing companies.

For approximate calculation a simple mechanical device known as the *slide rule* is much used by engineers. It consists of two strips of wood, each about ten inches long, which slide on each other and which are marked with a graphic logarithmic scale, thus making it possible to perform mechanically simple multiplications and divisions, as well as to find powers and roots.

The use of modern calculating machinery is rapidly extending, and will in all probability have some slight influence on the future teaching of arithmetic. Although the machine will never do away with the teaching of this subject, it will put a premium upon accuracy and will lessen the necessity of teaching rapid calculation. C. B. U.

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MECHANICAL DRAWING. — See DRAWING; INDUSTRIAL EDUCATION; TECHNICAL EDUCATION.

MECHANICAL ENGINEERING. — See TECHNICAL EDUCATION.

MECHANICS' INSTITUTES. — England. — Associations of artisans and workingmen which sprang up under the rising influence and importance of the industrial occupations at the end of the eighteenth and the beginning of the nineteenth century. Their aim was mutual improvement and study of the sciences as they applied to industries at a time when school facilities were practically nonexistent for the lower classes. Addresses by teachers of science, lectures by members, discussions, experimental work, provision of libraries, evening classes, and day schools were among the activities in which many of the mechanics' institutions engaged. Societies for mutual improvement began to make their appearance in the seventeenth century, *e.g.* the Society for the Reformation of Manners, in which Defoe was interested, was founded in 1690. The history of mechanics' institutions, however, is usually traced back to two sources — Birmingham and Glasgow. At Birmingham there was organized in 1789 a Sunday society for the purpose of keeping the members of the Sunday school together; lectures were arranged in mechanics and physical science. In 1796 this society became the Birmingham Brotherly Society, which was joined by the Birmingham Artisans' Library (f. 1797). More important, however, was the influence of John Anderson and Dr. Birkbeck (*qq.v.*). At Anderson's University, founded by the former, Birkbeck was able to get into touch with the artisan class, and gave courses to meet their needs. In 1823 the Glasgow Mechanics' Institute was established by former members of Anderson's Institution. Meanwhile a strong appeal was made in 1814 in the *Monthly Magazine* for the establishment of literary and philosophical societies for the middle and lower classes; suggestions were here advanced for the arrangement of mechanics' institutes. In 1821 Mr. Leonard Horne, a merchant and geologist, founded the Edinburgh School of Arts. The London Mechanics' Institution was founded in 1823, with Dr. Birkbeck as its president, and with the strong support of Lord Brougham. It was through the influence of the latter that the Society for the Diffusion of Useful Knowledge (*q.v.*) was established in 1825, with the needs of mechanics' institutions and popular libraries in view. The institution included a library, circulating and reference, and a reading room, a museum of machines, models, minerals, and natural history; a workshop and laboratory, classes for arithmetic, algebra, geometry, and their applications; and provided lectures to its members on natural and experimental science, mechanics, astronomy, chemistry, literature, and the arts. The majority of the managing committee consisted of workmen, a common feature in most successful mechanics' institutes. In the same year the Mechanics' and Apprentices' Library was founded in Liverpool, which was influenced by the New York Mechanics' Institution. The equipment and provision of classes and lectures followed the same lines as of the preceding. A feature of the instruction here given was the distribution of prizes. A day school for boys is also maintained as a preparation for the higher work of the evening schools. The Manchester Mechanics' Institution, founded in 1824, has played an important part in the development of technical education in Manchester. It was established "to enable artisans of whatever trade they may be to become acquainted with such branches of science and art as are of practical application in their trade." The building had special accommodations for work in science. Lectures were given twice a week on natural philosophy, natural history, literature, and the useful arts. Classes were held for instruction in writing, grammar, elocution, and composition, arithmetic, algebra, and geometry, architectural and mechanical drawing, vocal music, French, Latin, German, and chemistry. A large library and day schools for boys and girls were also maintained. The institution emphasized more and more technological instruction, and made rapid progress after the members came to it with better preparatory equipment. In 1880 its title was changed to technical school, and in 1892 it was taken over by the Corporation, which has erected for its school of technology one of the best equipped buildings of its kind in the world. Mechanics' institutions spread rapidly up to 1830, and met with more or less success. Of considerable interest are the few successful institutions which arose in rural centers, *e.g.* Lewes, Chichester, Lincoln, Hastings, and St. Leonards', with circulating boxes of books, traveling lecturers, and local branches among the neighboring villages and hamlets. But the chief centers were London, Lancashire, and Yorkshire. In 1839 a Metropolitan Association of Mechanics' Institutions was formed, following the example of the Union of Mechanics' and other Literary and Scientific Institutions in the West Riding of Yorkshire, and in 1747 the Lancashire and Cheshire Union and in 1848 the Yorkshire Union (with eighty-six institutions) came into existence. According to Sadler, in 1850–1851 there were 610 literary and mechanics' institutions, with a membership of 102,000; following a statement of the Earl of Carlisle in 1846, one in fifty-four of the population in Yorkshire belonged to a mechanics' institution, and in some places one in seventeen.

While the mechanics' institutions were to a certain extent successful, it has been doubted whether they attracted the class of people for whom they were intended. The artisan and lower classes had not the educational foundations to profit by the institutions, and in many cases the fees for membership, classes, and schools appears too high. The educational work of the institutions declined during the class struggles of 1848, but were again stimulated by the grants of the Department of Arts and Science (1859). With their schools of design and scientific instruction, the institution laid the foundation for the development of technical schools.

In the early part of the nineteenth century a number of such institutes were founded in the cities of the United States, and formed an important factor in the developing interest in public education. The institutes of New York, Rochester, and some other cities yet exist. The movement for the establishment of such institutions was connected with the Lyceum movement (*q.v.*).

See Adult Education.

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MECKLENBURG-SCHWERIN, GRAND DUCHY OF, EDUCATION IN. — See GERMAN EMPIRE, EDUCATION IN.

MEDIEVAL EDUCATION. — See MIDDLE AGES, EDUCATION IN.

MEDIAN. — See CURVE, GRAPHIC; STATISTICAL METHOD.

MEDICAL EDUCATION. — **History.** — In the sense in which the terms are now used medical education has a brief history, for scientific laboratories are even in Germany less than a century old and organized clinical teaching even more recent. Nevertheless, on the continent of Europe, medicine has been for centuries one of the four learned faculties constituting the university. At Salerno, Montpellier, Paris, and other medieval universities the subject was taught canonically: Hippocrates, Galen, and other authorities were expounded to students by professors, each of whom was capable of teaching every branch. The development of anatomy and the physical sciences toward the close of the Middle Ages affected medical thought rather than medical education; for the universities lacked the facilities and the spirit requisite to the adaptation of educational methods to scientific advance. In consequence the most important part of the student's training was obtained after he left the university, and as hospital or physician's apprentice he procured a limited amount of concrete experience. Medical education began to lose its medieval character in Germany early in the nineteenth century, when university laboratories and subsequently university clinics began to be established. Its most rapid strides have been made since 1856, at which date Virchow enunciated his cellular pathology, — the most fruitful single contribution ever made alike to medical education and to medical science.

In Great Britain medical education has followed a different line of evolution. It began in the hospitals, not in the universities. Hence it has been from the first consistently practical. Originally each hospital physician had his own students who, having paid him for the privilege, "walked the wards" in his company. Anatomical and other instruction they procured at private establishments outside the hospitals. In the course of the nineteenth century the various elements were brought together to form hospital schools: the teachers joined to form a faculty; their separate apprentices, brought together, formed the student body; the necessary laboratories were one by one built in close proximity to the hospitals.

Latterly, the marked development of laboratory teaching has tended to force the medical schools into the universities. The hospital schools have been unendowed private ventures, relying on fees. For many years they were highly profitable; but the needs of laboratory instruction now absorb all fees and call for additional support. The future of medical education in Great Britain lies with universities which, whether endowed or state-supported, will be in position to develop medical laboratories and clinics of modern type.

America practically repeats British experience. The reader is referred for additional details to the account of medical education in America given below.

Medical education aims to bring a number of sciences and a considerable body of knowledge acquired through experience to bear in the treatment of disease. Modern medical education differs from all previous forms of the same discipline in the increased scope and importance of the recognized sciences and the consequent limitation of the part played by mere clinical experience.

In former times, despite the fact that theoretical exposition of traditional medical doctrine consumed a considerable part of the student's time, his actual training was procured practically as an apprentice in hospitals or in the private practice of his preceptor. With the development of the underlying sciences the range of theoretical exposition has been greatly contracted and the apprenticeship has itself fallen into disuse, as it has become necessary and possible to substitute for it more systematic training in medical schools and hospitals connected with them. At the present time the details of medical education vary greatly from country to country. As it is impossible to describe fully the methods pursued in all civilized lands, the present article will restrict itself to four representative countries; namely, Germany, Great Britain, France, and the United States.

For further details concerning medical history, see GALEN; HIPPOCRATES; UNIVERSITIES; MIDDLE AGES.

Germany and Austria. — Medical education in Germany and the Teutonic countries in general is, and has long been, exclusively and entirely a university affair, the medical faculty being one of the four traditional faculties constituting the complete German university. This has proved a most fortunate circumstance, for in consequence of the connection of medicine with the university all modern developments in the underlying sciences have been at once brought to bear in the solution of clinical problems, since the hospitals have been throughout the last century under university control. The ideals of the university, which combined research with teaching on a high plane, have been the ideals of medical education in Germany. The profession has therefore always been an educated profession and the German physician an educated man. Matriculation in the medical faculty has been limited to graduates of the German gymnasium precisely as matriculation in any other university faculty. Up to 1900 this privilege was confined to graduates of the classical gymnasium. Since that day it has been extended on equal terms to graduates of the Realgymnasium and the higher Realschule, with the single additional requirement that graduates of the last-named school must demonstrate an elementary acquaintance with Latin, which subject is not included in the program of the higher Realschule. Despite the lengthy tradition favorable to the classical gymnasium as the basis of all university study, the two scientific secondary schools are gradually making inroads and the proportion of medical students from them is likely in the future to grow steadily. The following table shows the situation in this respect in three recent semesters: —

Semester	Total Matriculation in Medical Faculty	From Classical Gymnasien	From Real Gymnasien	From Higher Realschulen
1908 (Summer)	2,786	2,379 (85.3%)	320 (11.5%)	87 (3.2%)
1909 (Summer)	3,669	2,877 (78.4%)	589 (16.1%)	293 (5.5%)
1910–11 (Winter)	3.536	2,832 (80.1%)	535 (15.1%)	169 (4.8%)

Discussion is still in progress as to which of the three permissible secondary schools constitutes the fittest discipline preliminary to a medical education. The overcrowding of the medical curriculum, partly because of the necessary providing for all the sciences, partly because of the expansion of the medical field itself, is one of several factors responsible for the gradual veering of opinion in the direction of the scientific gymnasien.

The medical curriculum of the university may be divided into three parts, the first containing the sciences which are not in themselves strictly medical, but are essential to a thorough mastery of the medical sciences proper. The sciences in question are chemistry, physics, and biology, including botany. The second division includes the medical sciences proper; namely, anatomy, physiology, pharmacology, pathology, bacteriology, and legal medicine. The third group contains the clinical subjects, medicine, surgery, obstetrics, gynecology, pediatrics, ophthalmology, dermatology, etc. The sciences of the first group — chemistry, physics, and biology — do not, properly speaking, belong to the medical curriculum, and are indeed, as a rule, taught by the philosophical faculty. Only the traditional domination of the classical gymnasium could have kept these sciences so long in the medical curriculum. In consequence of the heavy burden which the student of medicine carries, his study of the preliminary sciences is hurried and unsatisfactory. He is instructed in them almost altogether by lectures, illustrated by professorial demonstration. In chemistry alone is he actually required to take a practical course. His overwhelmingly theoretical training in these fundamental branches is an obstacle from which the average German student of medicine does not in most cases recover, for, though the teaching is as concrete as illustration can make it, the student does not himself master the chemical and physical manipulations upon which his subsequent studies so largely presume.

The instruction in anatomy is both practical and theoretical. The student is required to procure thorough training in dissection and in practical histology. In addition he attends lectures on general and special anatomy, and toward the close of his medical course is required once more to review the subject by following a course in topographical anatomy. In physiology likewise his instruction is both theoretical and practical, but the lectures are more heavily emphasized than the practical course, which may or may not closely accompany them. Pharmacology and hygiene are presented theoretically with demonstrations. The course in pathology is, like that in anatomy, both theoretical and practical. The student attends lectures on the principles of pathology, on general pathology, and special pathology, all of which are abundantly illustrated with fresh and preserved specimens. In addition he must, in order to pass his examination, himself take part in autopsy work. Bacteriology is assigned to hygiene.

Each of the subjects which have been mentioned in the preceding sketch has in the German university its own institute, or laboratory, as we should call it. The institutes are organized and equipped on substantially similar lines. The head, called the director, is the professor, devoting himself entirely to his specialty. He has a few assistants, the precise number varying with the size of the institute, the number of students, and the number of subdivisions the institute contains. For example, the institute of anatomy invariably contains two subdivisions — gross and microscopical; the institute of physiology has, as a rule, separate subdivisions for chemical, physical, and operative work; the institute of pathology, when completely developed, as at Berlin, contains divisions for gross pathology, pathological histology, experimental pathology, chemical pathology, and bacteriology. It happens not infrequently that one or more of the subdivisions mentioned may be missing, now on account of lack of funds, again, because a suitable incumbent may not at the moment be available. In the long run, these defects are of no consequence to the student, for in the course of his wanderings — the German student being given to migrating during his medical studies — he will find at one university what he may have omitted at another.

The arrangement and equipment of the institute invariably take thought for both teaching and research, for the German university professor, in the medical faculty as elsewhere, is at one and the same time instructor and producer. The institute contains lecture halls, classrooms, and separate suites for the investigative work of the professor, his assistants, and research students. Laboratory facilities differ in extent, but not in type, in the different universities. They are large at Berlin, Vienna, Leipzig, and Munich, — the anatomical institute at Munich being a palatial structure; they are small and more modest in appearance at Greifswald, Würzburg, Graz, and other universities. But in essential character and equipment all take thought for teaching and research at the same high level. This uniformity is due in no small degree to the custom of "calling" professors from one institution to another. Obviously, to induce a rising scientist to leave one post for another, as good or better facilities must be offered to him.

The German student is required to complete his work in all the sciences already named except pathology and bacteriology, before undertaking clinical study. To these sciences he is required to devote at least five semesters. German teaching of these subjects has obvious points of strength as well as weakness. The student is taught by progressive scientists in active laboratories. He works, therefore, in a highly stimulating atmosphere. Abundant opportunities are given to him to do more than the required minimum in any subject in which he develops interest or capacity. Having satisfied the examination requirement, he may enter one of the many advanced courses offered in all institutes or he may as undergraduate volunteer (*Famulus*) make himself practically a part of the organization of the laboratory during vacation time; or, having passed the necessary examinations, he may pause long enough to undertake a piece of original research under the direction of the professor. How large a proportion of the German medical students actually take advantage of the opportunities thus afforded it is difficult to say, but the German system of university instruction is explicitly designed to favor these more active and energetic individuals. The weakness of the instruction lies in the excessively demonstrative character of the required teaching. In all subjects a large part of the student's time is consumed in attending lectures and witnessing demonstrations, — even in anatomy, where, however, there is no lack of practical instruction besides. The unambitious student, who contents himself with doing only what he is by the letter of the law compelled to do, receives an education which is far too theoretical and passive. The practice of medicine involves the actual application of the sciences to clinical problems, but this application can be made only by students who have acquired a practical scientific technique. On the technical side, however, German medical education is weak unless strongly reënforced by voluntary activity on the student's part. While the best German students can get a rich, varied, and concrete training, the average student and the poorer student may escape with inferior practical training.

Germany is perhaps the only great country in which clinical education is on precisely the same footing as that of the underlying sciences. The German professor of medicine and surgery is a university professor selected for capacity only. As the clinical branches are under complete university control precisely as any other subject, the state seeks its clinical teachers wherever it can find them. Professors of medicine and surgery are therefore called from one university to another like professors of mathematics, philosophy, or chemistry.

There is a common notion that the German government is enabled to choose clinical professors in this fashion because the state, or, what is the same thing, the university, actually owns the hospitals in which clinical instruction is given. It is supposed that these hospitals have been created simply for the purpose of furnishing the proper opportunities for clinical instruction. As a matter of fact, this is by no means universally the case. In Prussia and in Württemberg the hospitals in which the universities carry on their clinical teaching are state institutions in which, therefore, the university enjoys complete privileges, but in principle the case is not otherwise in other states in which the hospitals are not state institutions. In Leipzig, for example, where the State of Saxony maintains its university, the clinical teaching of the university is carried on in the wards of a municipal hospital. The same situation exists in Munich, where the Bavarian government procures the requisite medical clinics for its university by making a contract with the municipality. At Strassburg the Empire makes a similar arrangement for certain wards with an endowed hospital, as does the Austrian state in Vienna. In Graz a provincial hospital is utilized, in Würzburg a hospital supported by a religious endowment. In all these instances alike the state enjoys essentially the same privileges. It has the right to appoint professors, who in virtue of their appointment to university chairs become physicians and surgeons to the hospitals in question, and the university professor whose clinic is situated in a municipal or endowed institution has the same rights and privileges as are enjoyed by the university professor in Prussia who teaches in a university hospital. These different arrangements work smoothly for two reasons. In the first place the university professor, who is also a hospital physician, receives a salary. His university and hospital work constitute, therefore, the first claim on his time and attention. In the next place executive responsibility and medical care are sharply differentiated. The hospital authorities, whoever they may be, appoint a hospital administrator who looks after everything that pertains to housekeeping. It is his duty to attend to all details involving supplies, repairs, nursing, etc. Equally complete is the authority of the hospital physicians and surgeons in reference to the medical and surgical conduct of the wards. Superintendent and physicians are not accountable to each other, but both are accountable to the higher authority. Thus all friction is avoided. As these arrangements obtain in all hospitals alike, there is no essential difference between university and non-university institutions.

The clinic differs from the scientific institute previously described in having to care for patients; it resembles the scientific institutes in having also to provide for both teaching and research. Its equipment and organization reflect the three purposes for which it exists. The staff consists of the professor, known as the director of the clinic, assistants varying in number according to the size of the clinic, and advanced and voluntary workers who come into the clinic for the purpose of following the work of the staff or engaging in original research. The equipment consists essentially of the wards, lecture halls always equipped for complete clinical demonstrations, classrooms for the conduct of undergraduate courses, research laboratories for the work of the professor and his immediate assistants. The research laboratories vary in character with the interest of the professor. They are, as a rule, equipped for investigation on the chemical, physiological, or bacteriological side of clinical problems. As a rule, the professor is in general charge of the clinics and the laboratories. Each assistant has a separate ward to look after, and, as a rule, is at the same time in immediate charge of one of the laboratories. While the entire staff is often engaged together on some large problem, the individual members of the staff are usually occupied with their own problems besides. The required clinical teaching takes the form of clinical or surgical demonstration. The undergraduate students assemble daily in the amphitheater connected with the clinic to witness a clinical demonstration by the professor. Two, sometimes three, cases are shown each day. The professor describes in great detail all the significant features of the case, explains the various alternative diagnoses, gives the considerations which determine his judgment in favor of one as against the others, and thereupon launches into a scientific discussion of the disease in question from all its different aspects, pointing out how it is to be distinguished from other similar affections, the course it runs, the treatment to be applied, and the outcome to be expected. For these lectures thorough preparations have been made in advance, and it is not too much to say that, as a rule, they represent a very high order of demonstrative performance.

A medical education largely made up of demonstrative lectures is obviously open to the objection already pointed out in connection with laboratory teaching; namely, that it is too theoretical and too passive. By way of meeting this criticism various devices are resorted to. First, the professor is required to call down into the arena from the amphitheater every student at least twice in the course of a semester. This student, who is known as a *Praktikant*, is expected to examine the patient, to make a diagnosis, and to offer suggestions as to treatment. The professor quizzes him and requires him to defend his propositions. The device cannot be regarded as a great success. The students are nervous, timid, and unequal to the responsibility of making and defending a diagnosis on short notice, for they have had no previous opportunity to examine the patient exhibited. Moreover, the moment the professor devotes himself closely to the *Praktikant* the rest of his audience becomes inattentive. Most professors, therefore, attend mainly to the audience, the part of the *Praktikant* becoming very often almost nominal. In the smaller universities the device works more satisfactorily because, the class being small, greater informality is possible.

2. A second corrective is found in the practical courses in physical diagnosis and clinical microscopy given by the assistants in the clinic. The professor, who has complete control of the material and facilities of the clinic, encourages his assistants to offer special courses designed to train small groups of students in the arts of percussion, auscultation, and palpation, and in the microscopic and chemical examination of urine, sputum, etc. These courses are offered in large numbers, and as abundant material is at hand in the clinics and out-patient departments, the student gets an excellent training. Similar courses are offered in surgery, where dressing, bandaging, and diagnosis are thus taught, and in the woman's clinic, where the student learns the important obstetrical manipulations.

3. As in the laboratory branches, and more commonly than in the laboratory branches, students are invited to enter the clinic informally, chiefly during vacation time, as *Famuli*, or undergraduate volunteers. They are thus privileged to follow as closely as they will all the activities of the clinic.

4. At the conclusion of the student's course, after he has passed all his examinations, he is required to spend a so-called practical year in an approved hospital. As a rule, at least one half of this period must be spent in ward work.

In addition to the required work, above dealt with, the clinics, like the scientific institutes, offer a great variety of courses and a great variety of optional opportunities for the benefit of graduates and undergraduates who are eager to do more than is required of them. On the clinical side, as on the laboratory side, everything is done to encourage the unusual student. The average and poor students can undoubtedly get along with very little practical exertion on their part, but no student who is eager to do something above the minimum ever lacks abundant opportunity and encouragement. These optional opportunities are so extensive and so largely utilized that they must fairly be considered the very essence of the German system of medical education. Despite its defects, it is therefore probable that the German profession is more scientifically trained than that of any other modern nation. Beyond question this is true of the leaders, namely, the professors and their assistants. Nowhere else, indeed, is there to be found anything that is equivalent to the German assistant who, attaching himself to a laboratory or clinical chief, remains in scientific service for a long period of years, sharing the productive work of his superior, carrying on his own investigations, and coming into close contact with a large body of students. From the assistants, division chiefs and professors are almost invariably selected. The prolonged activity of the assistants in the fundamental sciences prepares them to carry on clinical and surgical work on a thoroughly scientific basis.

In the actual arrangement of his course of study the German student has very considerable leeway. He is controlled only by certain restrictions imposed by the examination ordinance. It is required that he pass all examinations in the scientific branches as far as pathology before he can obtain time credit in any of the clinical subjects. The curriculum is thus divided into two mutually exclusive parts, the first containing physics, chemistry, biology, botany, anatomy, and physiology, the second pathology, hygiene, and all the clinical branches. No fixed order is prescribed for these subjects on either side of the dividing line. This looseness of structure enables students to migrate freely from one institution to the other, an admirable feature, since every student can thus procure for himself the conditions of study which he prefers and the instruction of any teacher whom he especially desires to follow. On the other hand, it is not without its disadvantages, for not infrequently the natural sequence of subjects is disarranged, to the unmistakable disadvantage of the student. Chemistry and physics, for example, should undoubtedly precede physiology, which employs them both. Nevertheless, it happens that a student will complete his required work in physiology before completing either or both of the subsidiary sciences. In the clinical division sequence is in general less material. There are, however, certain principles of order which cannot be safely neglected. Before entering a medical clinic the student requires to understand the more common pathological terms and phenomena, and he must obviously know how to procure and how to interpret common physical signs; he ought, therefore, to have followed a course in percussion, auscultation, and palpation. Before entering the surgical clinic he should have followed an elementary course in surgical diagnosis and should have learned bandaging, dressing, etc. Obstetrics in the same way presupposes proper training with the manikin. These fundamental correlations having been enforced, it makes little difference in what order the student obtains his clinical training. The student is recommended by a plan of studies put forth by the different faculties to procure for himself at the proper time the fundamental training just described. Nevertheless, he is not required to do so. He may enter any of the various clinics without the proper preliminary discipline, and he not infrequently does. In some cases the technical training is acquired subsequently by following the practical courses above described. Other students procure it by serving as *Famuli* or volunteers in the various clinics prior to their examinations. Others pick up fragments in different ways and trust largely to good fortune. The same result already mentioned thus reappears. The minimum training may be decidedly unsatisfactory. Meanwhile there is hardly any limit to the training that can be procured by earnest and capable students.

It might be supposed that the examinations for the license to practice would interpose so as to cut off those students who have slighted their duties. This is the case in theory, but not in practice. The real guarantee of the competency of the German doctor is not so much the examination now about to be described as the high entrance basis already touched on. Before admission to the university the German student must have passed through a severe educational discipline which rejects the feeble and trains to severe habits of application the more competent. While in the early semesters of university life there is doubtless some reaction from the gymnasial discipline, it is nevertheless true that the German student has a trained mind. He is capable of and accustomed to hard work, and in this fact is found perhaps the most significant factor in connection with the high level of German medical education.

Two examinations are conducted in Germany, one for the title of practical physician (*praktischer Arzt*), the other for the degree of Doctor of Medicine. We may consider the latter first. The degree of M.D. is an academic title, and gives the holder the right to teach. As the examinations leading to it are held subsequently to those which give the title of practical physician, they are largely matters of form. The student is required to prepare a thesis, to submit to a brief interrogation by a committee of the faculty, and to pay certain heavy fees.

The examination for the license to practice is a much more serious affair. It is known as the state examination, as distinguished from the degree examination, which is a concern of the university as a teaching body. The state appoints an examination commission at each university, made up almost entirely of professors. These commissions delegate the examinations in the different branches to the professors immediately concerned. Examinations take place almost continuously throughout the semester, students being examined singly or in small groups. The examination ordinance prescribes in great detail how the various tests are to be carried on. The first examination lasts four days, of which anatomy consumes two, physiology one, and the remaining subjects one. The regulations specify that in anatomy each candidate must describe a designated part, make a dissection, answering questions as he proceeds, and prepare two microscopical preparations. The examination in physiology covers general physiology, including physiological chemistry, and requires both oral and practical work. The examinations in physics and chemistry are oral only and are meant to keep in view the needs of the future physician. In zoölogy, comparative anatomy and physiology are to be emphasized; in botany, the anatomy and physiology of plants, especially those with medicinal properties. Should the student fail to pass in any subject, he is allowed two more trials from two to twelve months later. If he fails a third time, he is denied any further chance to retrieve. As a matter of fact, examiners are so reluctant to deprive a student of his career that those who come up for the third time are invariably passed.

The clinical examination, which is considerably more complicated, begins with pathology divided into two parts, pathological anatomy and general pathology, occupying one examiner two days. The candidate must do part of a *post mortem*, writing the protocol. He must make several microscopic preparations, expounding at least one, and finally must be subjected to an oral quiz on the principles of the science. The medical examination falls into two parts, and lasts almost a week. In the first part, conducted by two examiners in the medical wards or out-patient department, the candidate must examine two patients, making diagnoses, suggesting treatment, and giving a prognosis. At home he must write a critical account to be handed in next day. Thereafter daily for four days he must visit the patient once a day or oftener and report his observations to his examiners. The second part consists of a written examination in prescription writing and an oral examination in pharmacology and toxicology.

The surgical examination embraces four parts, and also lasts about a week. The student must handle two cases on much the same lines laid down for medicine, must be examined practically in bandaging, setting of fractures, etc., and must operate on the cadaver. Obstetrics, ophthalmology, and psychiatry are handled in the same fashion. A single day is devoted to oral examination in hygiene and bacteriology. As a rule, the subjects are arranged at intervals of six weeks. The student must pass in every subject before he can begin his practical year.

The merits of the examination are undoubtedly great. Its general tendency is to force the student to acquire practical skill. The foreknowledge that to pass anatomy he must dissect, to pass in medicine he must make a physical examination and diagnosis, to pass in obstetrics he must participate in a delivery, cannot but exert a favorable influence on the course of his studies. Moreover, the moral and practical influence of meeting his teachers face to face is marked. On the other hand, it must be confessed that examiners are frequently lax. The mere fact that examinations spread through the entire semester conduces to leniency, for, as the professor has all his other engagements to attend to, he is, especially in the larger universities, tempted to hurry, and haste is more apt to result in laxity than in severity. Moreover, though many weak students drop out before the third trial, those who persist can count confidently on being passed. In Austria students are sometimes rejected at the third trial, but on application the Emperor grants further opportunity, so that as a matter of fact, in Austria as in the German Empire, the student who persists will ultimately be successful.

The cost of a medical education is heavy, varying less than one would be disposed to think as between large and small towns. About 300 marks usually are required for tuition fees, books, etc.; living expenses, exclusive of clothing, are estimated at about 1200 marks for the two semesters; 7500–8000 marks make the minimum for the entire course, and leave the student without allowance for examination fees or vacations. Twenty years have made no material change in this respect.

The lot of the needy student is, however, variously relieved. The payment of fees is after all a private matter in the hands of the professor: he is free to waive his rights entirely or to grant a respite, if he pleases. At certain universities, committees are appointed, who, evidence of pecuniary incapacity being shown, grant a delay of six years, at the close of which period the proper officials endeavor to collect the debt; further postponement is common. Scholarship funds also exist, the income of which is annually distributed. In the two semesters 1905–1906, out of a total attendance of 40,509 in Prussian universities 5023 enjoyed fee-exemption; 8435 (many of course already counted among those exempted from fees) received additional aid; among them 966,720 marks were distributed.

Great Britain. — Medical education in Great

Britain is not, as in Germany, controlled by the government, but practically control has been delegated by the government to certain corporations; namely, the royal colleges of physicians and surgeons to be found in London, Edinburgh, Glasgow, and Dublin, to universities possessing medical departments, and to the General Medical Council, a representative body consisting of delegates chosen by all the corporations above mentioned and the registered profession at large. Each of these corporations, with the exception of the General Medical Council, conducts examinations which admit to practice, and each has in theory complete freedom to conduct such examinations as it will. As a matter of fact, however, all conform to something like the same standard, a consequence partly of corporate pride, partly of professional solidarity, partly of the influence of the General Medical Council. The General Medical Council was created by statute in 1858 for the purpose of publishing annually an accurate register of authorized practitioners in order that the public might be enabled to discriminate the trained from the untrained. The Council was also given the right to inspect and to criticize the qualifying, or, as we should say, licensing examinations. This privilege has been skillfully cultivated so as to increase greatly the importance of the Council. It has, as a matter of fact, no coercive power over medical education. It cannot visit a medical school, it cannot dictate the curriculum, it cannot refuse to register a candidate who presents the qualification of one of the abovenamed corporations, even though it should hold the qualifying examinations to have been unsatisfactory. It can at most protest to the qualifying body itself, and in the event that the offending body fails to meet the objections raised by the council through its representatives it can carry its protest to the Privy Council, which has large powers of action. As a matter of fact, extreme measures have not been necessary. Publicity and constant hammering on the part of the council have succeeded in bringing the less conscientious and advanced examining bodies up to the standard regarded by the General Medical Council as satisfactory.

The situation in Great Britain is much complicated by the fact that medical education was originally altogether in private hands, where it still rests in large measure. The English doctor originally got his education as an apprentice, attaching himself to a hospital physician, whom he accompanied on his rounds and sometimes on his visits. His fundamental training in anatomy he got in the private classes which flourished in London, Edinburgh, Glasgow, Dublin, etc. As students increased in number and hospitals increased in size, the apprentices were brought together to form a school and the hospital physicians and surgeons formed a teaching faculty. These conditions prevailed generally up to very recent times. The student fees formed a substantial source of income to their teachers, who also profited subsequently by acting as consultants to their students when the latter went out into practice.

This proprietary order is now in process of destruction. The necessity of providing the student with training in the fundamental laboratory branches has eaten up the profits of the proprietary medical school. Almost everywhere practicing physicians have ceased to teach chemistry, physics, anatomy, physiology, and other laboratory branches. As far as these subjects are concerned the British medical school is rapidly approaching the German plan of organization. In the Scottish universities, at Oxford and Cambridge, in the provincial universities, and in the King's and University colleges in London the scientific branches belong to the universities and are handled like other university subjects. They are taught by specialists, in laboratories equipped, as far as financial resources permit, for teaching and research. But nowhere as yet in Great Britain does a university really control its clinical facilities. Clinical teaching, therefore, remains as formerly in the hands of the visiting staffs of the local hospitals. At Glasgow, Edinburgh, and Manchester the local universities have procured some limited privileges in respect to the designation of teachers of medicine and surgery, but in general the clinical branches in Great Britain are taught incidentally by the practicing physicians who form the unpaid staffs of hospitals maintained by volunteer subscription. To this point we will recur in giving an account of the methods of clinical teaching.

No legal minimum is established in Great Britain in respect to general education which must precede the study of medicine. The various bodies dealing with the subject concur, however, in enforcing a requirement which includes English, Latin, arithmetic, algebra, and plane geometry. A student is admitted to a medical school on presenting a satisfactory certificate showing that he has passed the required examinations in these subjects. This standard is indisputably low. It can be met by an ordinary boy of fifteen or sixteen years of age. Students are, in fact, considerably older, the discrepancy being due to the unorganized condition of secondary education in England. (See EXAMINATIONS.)

The medical curriculum must be five years in length, and is on the average considerably longer. Its first year is devoted to instruction in the basic sciences — physics, chemistry, and biology. Anatomy and physiology take up the next eighteen months. The rest of the time is devoted to clinical studies, in which pathology is included. The teaching methods are much more concrete and practical than in Germany. Though systematic lectures are held in all subjects, the main emphasis in instruction falls on the practical exercises, which are well developed. Conditions are less satisfactory in chemistry, physics, and biology, because these subjects cannot be satisfactorily handled when crowded into a single year, but in anatomy and physiology theoretic instruction is distinctly subsidiary. In physiology especially the English excel. The laboratories in this subject have practically without exception individual equipment for every student, enabling him under direction to carry out all the important simpler experiments for himself. Around this experimental course all instruction in the subject centers. An important obstacle, however, arises from the stringent laws governing vivisection. The student's own work is limited to pitted frogs.

The equipment and scope of the scientific laboratories in Great Britain are, except in physiology, generally inferior to those in Germany, because medical schools lack adequate financial support. The university régime has not yet completely established itself, in consequence of which university departments of medicine often rely largely upon student fees which are necessarily inadequate to support teaching and research laboratories. While everywhere interested individuals are found engaged in research at one point or another, research is not yet characteristic of the English laboratory as it is of the German. In many schools anatomy is limited to dissecting, the head of the department being assisted by young physicians waiting for practice. Physiology is in general much better, some of the London laboratories and the laboratories in Edinburgh, Glasgow, Liverpool, Cambridge, and Oxford being fully up to the best continental standard. Pharmacology and hygiene are quite undeveloped as separate laboratories of an experimental character. As a rule, the activity of the laboratory departments expends itself largely in routine teaching. The low standard on which students are admitted, the scant resources which the various institutions command, and the lack of development of scientific ideals combine to keep teaching to an elementary level. This tendency is assisted by the existence of the variety of qualifications and the discrepancies between them. The proprietary school depends for its success on passing its students. As the schools have no resources but fees, they must bend every effort to promote the success of their students in the qualifying examinations. Courses are therefore arranged to comply strictly with the examination requirements which each student has in view. No student is encouraged to do more than he needs. During his spare time he is assiduously coached by his instructor, who, being used up in drill work and practice, has neither time nor energy to engage in investigation.

Pathology is the connecting link in England, as in Germany, between the laboratory branches and the hospital. Material is in general abundant, but pathological laboratories have been unable to develop on modern lines because of the strong prejudice against vivisection. In the London hospital schools pathology is limited to teaching in the dead house on morphological lines. In the universities the pathological department of the hospital is used for morphological work, while the professor sometimes maintains a separate experimental laboratory on the university grounds. At Glasgow alone does the university possess a modern laboratory of pathology in which morphological and experimental lines are combined. The hospital pathologist is now usually a specialist. His assistants are, however, generally young physicians and surgeons. The subject is taught with reference to its diagnostic use in medicine and surgery rather than as an independent scientific discipline. The students receive a course of instruction in the dead house, and are subsequently drilled in the museum to understand and to interpret pathological lesions as found in preserved specimens.

The English student gets his clinical education by attending the practice of the visiting physicians of a voluntary hospital. The quality of the instruction depends, therefore, altogether upon the character of the English hospital staff. Unlike Germany, where clinical professors are first of all teachers and are called to their posts after achieving distinction in inferior stations, the English hospital physician is a consultant who has in most cases attained his present appointment on the basis of seniority. Education and investigation are therefore secondary considerations. The hospitals lack the means and the attending staff lacks the time to engage freely in clinical investigation. The British student is, therefore, trained to be a practical doctor. He becomes quite expert on the technical side, but he does not receive the scientific discipline which is the distinguishing mark of modern medicine.

While British medicine suffers severely from the limitations just mentioned, it is nevertheless true that in respect to the student's contact with clinical material nowhere else in the world are conditions so favorable. In our discussion of Germany we pointed out that its clinical instruction was overwhelmingly demonstrative. In England, on the other hand, it is overwhelmingly practical. The British student has the freest access to the wards, which contain material enough for continuous participative instruction. Actual and continuous participation of the student in the care of the sick is thus the backbone of British clinical training. The student receives by way of instruction a practical discipline in noting and interpreting physical signs. At the conclusion of a fortnight he begins to " clerk." A physician, his assistant physician, and his house physician receive an assignment of perhaps six or eight students. The students are first taught the systematic taking of notes, whereupon the house physician escorts the little group on its first ward walk, allotting to each student or "clerk," as he is called, a certain number of cases for which he is to be held individually responsible. Each clerk is required to obtain the complete history and description of each of his cases and to make the requisite chemical and microscopic examinations. He has all necessary freedom and facilities, entering the wards without ceremony and readily procuring such material as he may request. His notes become, as a rule, part of the hospital records of the case. The house physician makes rounds daily with the clerks between 9.30 and noon. Twice or thrice weekly in the afternoon the senior physician conducts the same group over the same ground, quizzing both house physicians and clerks as they move from cot to cot. As each case is reached, the clerk responsible for it steps forward, reads his notes, and defends his findings, his proposed diagnosis, and suggested treatment in reply to the interrogations of the chief. Every student is therefore sharply questioned on his own case, and witnesses at close range the cases belonging to other students in his group. When a case terminates fatally, the teaching group repairs to the dead house to witness the autopsy. This concrete routine continues during about six months. It is supplemented by systematic lectures covering the entire subject. A similar procedure is followed in surgery. The student gets in the first place six weeks of preliminary training in surgical dressing in the out-patient department, where he is taught to dress cuts, to apply bandages, splints, etc. The surgical teaching unit is composed of the surgeon in chief, the assistant surgeon, the house surgeon, and five or six students who follow the daily practical routine for a period of six months. In the operations, which take place four times weekly, the dresser, as the student is now called, is next to the house surgeon first assistant in his own cases. On the occasion of a bedside consultation between a physician and surgeon the students of both attend.

In midwifery every student serves as in-patient clerk to the obstetric physicians for at least six weeks, during which period he takes histories, conducts pelvic examinations under the control of the resident obstetrician, and serves as second assistant at operations. For a fortnight he is on duty in the out-patient maternity. Cases are assigned in rotation. On a clerk's first cases he is accompanied by the junior resident obstetrician. Later he acts alone under distinct restrictions as to seeking aid if difficulties arise. Material is so plentiful that, though twenty cases are required, a student may easily procure from thirty to fifty. English clinical teaching, therefore, amounts essentially to a series of posts or appointments, each characterized by the active participation of the student incumbent. The English clerk and dresser are trained by going through all the motions which as physicians and surgeons they will have to perform. At the same time they work under such constant supervision and control that the interest of the patient is never imperiled.

The arrangement of the English curriculum is not wholly unlike that of the German. It is divided into two parts, though the precautions to prevent overlapping are less stringent than in Germany. In general, however, the student gives his first year to the basic sciences, the next year and a half or two years to the medical sciences, and the remainder of his time to clinical subjects. The specifications of the different examining bodies as to what he must do in each subject are very minute. He is required by the Conjoint Board in London to devote 180 hours to chemistry, 120 to physics, 120 to biology. The precise period which he must spend on anatomy, physiology, pathology, and each of the clinical subjects is likewise specified in the regulations. London University requires somewhat more; the Apothecaries' Society of London and the Triple Board of Scotland somewhat less.

The examinations follow instruction in emphasizing the practical and concrete. Much the most popular of the various qualifying bodies is the Conjoint Board of the Royal Colleges of Physicians and Surgeons in London, whose examination may be described as typical. Up to 1884 the two colleges conducted separate examinations. In that year they combined to form a Joint Board conferring a single diploma uniting both qualifications. The Board is managed by a joint committee who appoint as examiners teachers from the London and provincial schools. Though the examinations are wholly conducted by teachers, no teacher ever examines his own students.

The examinations in chemistry, physics, and biology, conducted by two examiners in each subject, are both written and practical. The practical and the written marks are combined to determine the student's grade. In anatomy and physiology four examiners each take part. They work in pairs, all being continuously engaged. Neither subject is counted without the other. In anatomy the oral test is conducted on a freshly dissected subject, dissected specimens in alcohol, and the bones. A living model is used for surface anatomy. In physiology no experiments are performed, but apparatus must be demonstrated; histological slides are employed as a basis for questioning. Simple experiments in physiological chemistry must, however, be carried out. Eight examiners officiate in medicine, acting in pairs. Two written papers are set, to be answered on consecutive days. The clinical examination takes place in an examination hall temporarily converted into a hospital ward. Each of the examiners sends from his hospital at least three patients. Every candidate is questioned on one "long" and two or three "short" cases. The candidate studies the long case for ten minutes, after which he is questioned on it. Thereafter he is questioned more briefly on the short cases. In the evening of the same day he is orally examined in medicine and chemical pathology, including the examination of urine, pathological slides, and gross pathological specimens, fresh and preserved. The surgical examination, similarly conducted, consists of a written paper, clinical or practical work, surgical anatomy, and surgical pathology. Other subjects are disposed of in the same fashion.

The examiners serve for periods of four or five years. The service requires several days at a time twice or thrice a year. For it the ablest and busiest men in the kingdom are obtained. The General Medical Council has the privilege of sending its visitors to inspect the examinations. Through the circulation of examiners and visitors a fairly uniform standard has been generally procured.

The examinations thus just described are in point of principle perhaps the best to be found anywhere. They permit interaction between the schools and the profession, and they demonstrate the feasibility of giving a practical test to large numbers of students annually by the combined action of teachers and practitioners. Such defects as may be pointed out in the English examinations are attributable to the conditions under which medical education in England is carried on, and have nothing to do with the principle on which the examinations are conducted.

The effort to keep insufficiently endowed medical schools above water has led to a steady increase of tuition fees, which have thus doubled in the last half century. About 1870 the total cost of an education at a large London school was 95 guineas; in 1880, 132; at present, 180. The smaller metropolitan and the provincial schools are slightly cheaper, — Liverpool costing about £150. The expense varies somewhat with the choice of the qualifying agencies: it costs perhaps £10 less to prepare for the Conjoint Board than for a university degree. Scotland has not yet adopted the composition or combined fee: at Glasgow the sum total of separate fees amounts to £150. Adding in the expense of living, we may estimate the total cost involved at £250–300.

France. — Medical education in France is, as in Germany, a university affair, but the medical faculty is only imperfectly developed on university lines. The professors in the medical department, in the laboratory as well as in the clinical branches, are practicing physicians, excepting only the anatomist at the larger universities. The appointments are made, with rare exceptions, from the local profession. Despite the association of medical teaching in France with the universities, the essential conditions resemble closely the proprietary arrangements characteristic of England.

In order to enter upon medical study the student must have achieved the baccalaureate that marks the termination of the *lycée;* in addition, he is required to pass a year in the study of the preliminary sciences. A baccalaureate course of secondary instruction plus a certificate covering the study of physics, chemistry, and biology, issued by the faculty of science, constitutes the basis of medical education throughout France.

The baccalaureate course takes any one of several forms, all leading to the same degree. Since the far-reaching secondary school reforms of 1902, complete parity has prevailed as respects the classics, the sciences, modern languages, and mathematics. A four-year primary course constitutes the uniform basis; seven years of secondary instruction follow, divided into two parts, four and three years in length respectively. In the first part, the student elects between the classics, omitting Greek if he desires, and a modern course largely scientific in content; in the second, he chooses one of four groups — the classic languages, Latin and modern languages, Latin and science, modern languages and science. The *lycées* of large cities are large and flexible enough to contain all the alternatives; at smaller places the authorities select with regard as far as possible to local conditions.

The French, like the German, boy is thus systematically trained with a clear view to a possible professional superstructure. The baccalaureate basis bears everywhere the same value. The teachers, who are shortly to begin training men to law, medicine, or what not, know exactly on what they have to build. It is true that, consistently with the Napoleonic origin of the system, the spirit of the *lycée* is less individual than the range of selection that it allows; but not improbably this is in part a survival from the former régime under which all were put through the same grind. Meanwhile, France has gone farther than any other country in stipulating that medical education shall repose not only on a sufficiently high and entirely uniform basis, but that this basis must be determined or supplemented by the specific requirements of modern medicine.

French medical education is overwhelmingly clinical in character. The French student is supposed to devote his mornings to hospital work. All laboratory instruction and all lectures on nonclinical topics are relegated to the afternoons. During the first year hospital attendance is optional. The afternoons of the first year are devoted to dissection. For this work the arrangements are still more or less crude and the teaching is confined almost wholly to dissection. The other sciences which occupy the afternoons of the subsequent years are demonstratively presented. Physiology is the only one which, even so, is adequately incorporated in the curriculum.

The clinical instruction of the French universities is conducted in municipal hospitals, in which certain privileges have been granted by contract to the State. In Paris, for example, the university controls eighteen services in hospitals scattered through the city. The heads of these various services, being university professors, are selected by the State from among those who have previously won in competition the position of associate professor (*agrégé*). As the university services are incapable of accommodating the number of students engaged in clinical study in Paris, the university recognizes the teaching of other incumbents of hospital posts. To each teacher, whether a member of the university faculty or merely a recognized hospital physician or surgeon, students are assigned in groups of twenty for terms of four months. The instruction is of a highly practical character. It begins and ends with the exhibition, examination, and observation of cases, and that too without preliminaries. There are no introductory or special classes in physical diagnosis or clinical microscopy. To acquire facility with the stethoscope, to learn percussion and palpation, a student is left to his own devices. In laryngology and otology alone are practical courses in technique conducted at the medical school.

The French student in general, the Paris student in particular, enjoys practically unrestricted opportunity to gain thorough familiarity with disease. Twenty students daily accompany a teacher through the wards. Each student receives by allotment two or three beds. His appointment runs for four months, during which period he has unobstructed access to his cases. He is expected to see them daily before the arrival of the chief. At the foot of each cot hangs a card bearing the names of those in charge. They are, to employ the English phraseology, clerks, to whom on reaching the case the teacher at once turns for a statement covering history, physical examination, etc. In the course of his two-hour clinic the instructor will exhaustively discuss three or four cases. Students other than those in personal charge of a case are free to interpolate questions or suggestions; and, the condition of the patient permitting, to verify by examination points of special note. Instruction in surgery and gynæcology is largely limited to diagnosis. It proceeds on much the same lines as instruction in medicine. Students are at work in the wards examining patients by nine o'clock. An hour later the professor enters. The patient having been selected, the student in charge reads his report, the professor commenting as he proceeds. On a small blackboard close by, professor or student sketches in order to show the size and relation of the parts in question or to depict a proposed operation. Toward the close of his studies the student is eligible to the position of *externe*, or assistant in the out-patient department, to obtain which post he must successfully compete in examination. At the termination of the externeship he is eligible to an interneship, also after competitive examination.

The foregoing description shows at once the strength and the weakness of French medical teaching. It is weak in so far as laboratory instruction remains in an undeveloped condition. The only laboratory branch which the student has a chance to follow thoroughly is anatomy. On the other hand, as far as a physician can be made by clinical experience, the French student is admirably situated, particularly if he is fortunate enough to obtain the posts of *externe* and *interne*. In the latter, which lasts four years, he is in position to utilize, subject of course to the control of his chief, the almost unlimited clinical resources of the French hospitals.

The general arrangement of the French medical school does not favor investigation on modern lines. The laboratory branches are domiciled in the medical school in one part of the city, the clinical teaching is carried on in scattered hospitals elsewhere. The French medical schools, therefore, are lacking in organic character. There is little intercourse, social or scientific, between men occupied in the laboratories and those occupied in the clinics.

The arrangement of the French curriculum is very simple. The preliminary sciences — chemistry, physics, and biology — claim the first year, anatomy occupies the afternoons of the second. Banishment of the other medical sciences to the afternoon of the clinical year keeps them in a largely theoretical and distinctly subsidiary form. The clinical assignments, which constitute the main part of all French medical education, come in no fixed order. In general, medicine and surgery occupy the third and fourth years; obstetrics, psychiatry, and other branches, the fifth year.

The four years forming the medical curriculum proper are divided into sixteen "inscriptions," the five examinations being fixed in reference thereto. The first, devoted to a practical dissection and an oral in topographical anatomy, may come at the student's option between the sixth and the eighth inscriptions; the second, *viva voce* in histology, physiology, and physiological chemistry, between the eighth and tenth; the third, practical tests in operative medicine, topographical anatomy, and pathological anatomy, and oral in topographical anatomy, general pathology, parasitology, and obstetrics, between the thirteenth and sixteenth; at any time after the sixteenth, the fourth and fifth, including therapeutics, hygiene, legal medicine, materia medica, pharmacology, surgery, medicine, and obstetrics. Finally, the student must submit an acceptable thesis.

America. — Medical education in the United States and Canada lacks the uniformity characteristic of medical education in Germany and France and the comparative uniformity which prevails in Great Britain. During the first four fifths of the nineteenth century medical education in America was wholly proprietary in character. The so-called medical departments belonging to universities were nominal in their relationship. The rapid settlement of the country called for a large number of physicians much more rapidly than they could be effectively trained. What happened was this. Groups of physicians in different places banded themselves together to form so-called medical schools. These schools had in the first place neither resources nor facilities. They were practically establishments for didactic teaching of descriptive anatomy and for the inculcation of textbook knowledge of medicine, surgery, and obstetrics. They had originally no hospital connections whatsoever. In time wretched dissecting rooms, carelessly conducted by busy practitioners, were added, and clinical instruction was improved by the exhibition of an occasional patient from the dispensary.

A step in advance was taken when the group of men constituting the medical school happened to be the staff of a hospital. These men had, it is true, little interest in education, but it paid them to teach, because, in the first place, they received the fees of their students, and in the second place their students sent them frequent consultations after they engaged in practice. The hospital connection led to the building of amphitheaters in proximity to the wards and to the occasional exhibition of patients in them; but the teaching was for the most part of didactic character, and the student was without any effective contact with disease. The schools were thus nothing more than money-making ventures unrestrained by the law. A school that began in October would graduate a class the next spring. No educational requirement was made for entrance. Any applicant who could pay his fees was accepted. As state boards were not in existence, the school diploma was itself a license to practice. A student for whom a majority of the professors voted passed. Educating medical students thus became so profitable a business that chairs in medical schools became valuable pieces of property and were freely traded in. First and last, the United States and Canada have in a little more than a century produced 457 medical schools. Of these about 130 still survive. Illinois has produced 39, Missouri 42, New York State 43, Indiana 27, Pennsylvania 20, Tennessee 18. The city of Cincinnati brought forth 20, the city of Louisville 11.

Against these demoralizing conditions protests were raised from time to time, but little progress was made until the early eighties. Since that day the course of study has been gradually lengthened until it is now everywhere four years, though a year may still vary from six to nine months. The course of study has also been generally, though not universally, graded. Almost without exception American medical schools all furnish some clinical teaching, though as yet only a few are adequately equipped in this respect. More progress has been made on the laboratory side, and it is almost universally conceded that the prospective student of medicine should possess some definite preliminary general education. The most important single event in the reconstruction of American medical education was the establishment in 1893 of the Johns Hopkins Medical School, entrance to which was limited to holders of a bachelor's degree.

In reference to their entrance requirements the medical schools of the United States and Canada now fall into three divisions. The first includes those that require two or more years of college work for entrance, the second those that demand actual graduation from a four-year high school or its approximate equivalent, the third those that ask little or nothing more than the rudiments of a common school education, perhaps not all of that.

About twenty institutions belong to the first class, all of them university departments supported and administered as actual parts of their respective universities: —

University of California
University of Chicago
Columbia University
Cornell University
Harvard University
University of Indiana
University of Iowa
Johns Hopkins University
University of Kansas
Leland Stanford Junior University
University of Michigan
University of Minnesota
University of Missouri
University of Nebraska
University of North Dakota
University of Pennsylvania
University of South Dakota
Syracuse University
University of Utah
Wake Forest College
Western Reserve University
Yale University

Something like fifty medical schools constitute the second division. Great diversity exists in the quality of the student body of these institutions. The regents' certificates in New York, state board supervision in Michigan, control of admission to their medical departments by the academic authorities of some universities insure a fairly capable and homogeneous enrollment in some medical schools. Others—some of them university departments, some of them proprietary institutions — are quite lax in the interpretation of what constitutes a high school education. The reader must be warned that the assertions of the school catalogues and the requirements of the state boards cannot in general be relied on. Careful investigation alone can determine whether an institution that represents itself as on a high school basis really enforces its alleged standard. The third division contains schools that are practically without any adequate entrance standard at all. While these schools are most numerous in the South, they are to be found in almost all other sections of the country.

In their external aspect the curricula of American medical schools follow a certain general type. The first and second years are devoted to the laboratory branches and the third and fourth to the clinical branches. The laboratory branches are developed on something like the German model in the schools included in the first division above mentioned. These institutions have at least four separate laboratories, — anatomy, physiology, and biochemistry, pharmacology, pathology, and bacteriology. · Hygiene is more or less prominent, especially at some of the state universities. In some schools increasing facilities are offered in all branches for both teaching and research. Most of the institutions here in question offer the entire medical course, but a few of them offer the laboratory branches in one place, the clinical in another — an arrangement greatly to be deplored, since both sides suffer seriously when isolated from one another. Six of these schools are so-called half schools, offering only the work of the first and second years. This arrangement involves perhaps no serious difficulty, as far as the teaching of anatomy and physiology is concerned, but unless, as at Oxford and Cambridge, a small hospital is at hand, pathology must be taught from museum specimens, models, and microscopic mounts, all of which have serious limitations. The schools of the second division move within narrower limits. Most of them live on fees. The best of them develop highly a department or two. The other departments are necessarily restricted. The quality of the student body likewise imposes limitations. Proper laboratory courses are impossible to boys whose preliminary education is defective. The best of the American medical schools on a high school basis endeavor, by careful selection of students and extraordinary pains in teaching them, to make the most of their situation. Less intelligently conducted institutions, content to operate on a lower plane, are commercially effective. Not a few are frankly mercenary.

There yet remains for our consideration the third division; namely, schools practically without any entrance requirements whatsoever. The conditions which prevail in these institutions are altogether scandalous. It is indeed stretching terms to speak of laboratory teaching in connection with them at all. Schools of this description may be found in the South without a dollar's worth of apparatus of any description whatsoever. In others the so-called laboratories prove to be dirty and disorderly rooms practically without equipment. Some of them have no dissecting rooms worthy the name. At others the dissecting room is filthy beyond description. Almost all make a pretense to teach chemistry, but schools can be found in which not even a complete set of reagents is at hand for the entire class.

In respect to facilities for teaching the clinical branches, conditions in America are even less satisfactory than we have found them to be on the laboratory side. In order to teach clinical medicine, surgery, and obstetrics, a medical school requires adequate hospitals properly equipped with laboratories in charge of physicians and surgeons selected by the medical school on the basis of their fitness to teach and investigate. These fundamental requisites are met by very few of the medical schools in the United States and Canada. The University of Michigan, the Johns Hopkins Medical School, and the University of Pennsylvania are the most prominent examples of medical schools which are in complete control of hospitals of fair size, that of the Johns Hopkins Medical School having been recently increased by the addition of certain previously missing clinics. Of the three institutions named, however, only the Johns Hopkins Medical School has freely selected its clinical teachers from other institutions. A few other medical departments might be mentioned which are closely affiliated with certain hospitals, enjoying considerable influence in the selection of the hospital staff, which thereupon becomes their own medical faculty.

More generally, even those schools which under existing conditions are regarded as possessing fairly satisfactory clinical facilities have practically no voice in the appointment of the hospital physicians and surgeons who are their clinical teachers. In order to get teaching facilities at all medical schools have found it necessary to appoint to professorships individuals who happen already to possess hospital staff appointments. These individuals are rarely interested in teaching for its own sake, and still less commonly devoted to research. Teaching is with them a side issue to which they give a certain amount of time and energy, not so much because any immediate remuneration is attached thereto as because it leads to consultation business in the future. To make matters still worse, hospital appointments in America rarely involve continuous service. America has devised the so-called rotating system under which physicians and surgeons serve their hospitals for terms varying from two to four months, at the conclusion of which period a new staff comes on duty. In order, therefore, to enjoy teaching facilities throughout the year the medical schools are required to appoint to professorships all the successful incumbents of a hospital service, or, more commonly still, to piece together facilities acquired in different hospitals. These hospital appointments are made for personal or political, rarely for professional or scientific, reasons. The fact that they are unpaid and discontinuous is of itself fatal to serious endeavor. It need not surprise us, then, to learn that American hospitals are provided, as a rule, with no facilities for research. With few exceptions their laboratories are limited to routine. The pathological department is a dead house, and often not even that.

Even under such circumstances the amount of material that is available for instruction is almost invariably below what is regarded as satisfactory in Great Britain or on the Continent. The best of American medical schools controls only a few hundred beds. A very large proportion of those that are fairly well equipped have access only to some 100 or 150 beds. Proper facilities in infectious diseases and obstetrics are almost never found.

In all sections of the country schools can still be found that are practically without hospital connections of any kind whatsoever. In Massachusetts, New York, California, Illinois, Mississippi, Nebraska, Oregon, and other states, institutions with no, or almost no, clinical connections still confer the degree of M.D.

Methods of teaching medicine and surgery must under these circumstances vary greatly. In the Johns Hopkins Medical School a highly successful effort has been made to combine the best points of the English and German methods. German university ideals and the English clerkship and dressership have been united to form a highly effective pedagogic method. Following the successful experiment there made, the English clerkship has been introduced by other schools, whenever indeed hospital managers have been willing to receive students on an intimate footing in their wards. Less favorably situated schools have had to rely on amphitheater demonstrations, resembling the demonstrative clinics given in Germany. The inferior institutions cling to didactic textbook instruction.

The cost of medical education in the United States varies greatly. It has long been alleged that the inferior medical schools are maintained for the benefit of poor boys who could not otherwise procure a professional education. The hollowness of this pretense is exposed by the fact that a four-year medical education in the feeblest schools of Chicago, Philadelphia, or Baltimore costs in tuition fees and board about $1500, for which sum a student could get two years of college work in a state university followed by four years in its medical department.

All chartered medical schools in the United States and Canada have the right to confer the degree of M.D., but this degree does not carry with it in America, as it does in Great Britain, the right to practice. The abuses in medical education led different states to create boards for the examination of those applying for the license to practice. The powers given to these bodies vary from state to state. In general, the state boards have the right to refuse an examination to students coming from low-grade educational establishments, but thus far this power has not been vigorously utilized. In addition, state boards are commonly authorized to refuse to recognize a medical education which has not been preceded by an adequate general education; but as to this also the state boards have been very slow to assert their powers. The real secret of the failure of the state boards, however, to eliminate incompetent institutions is traceable to the almost universal employment of written examinations. The only sort of licensing test that will suppress schools without adequate laboratory and clinical facilities is a practical examination such as obtains in Great Britain and in Germany. Proprietors of feeble medical schools have long since found out that they can effectively meet the state board tests by drilling their students in the various compends that have been prepared with a view to meet the exigencies of the state board examinations. In consequence of universal laws forbidding teachers of medicine to be members of these boards, the examinations in question are conducted by men who have no touch with education and are consequently often decidedly unsuitable. The participation of teachers and the introduction of the practical examination would go far to assist in the rehabilitation of all medical education in America.

Medical Sects. — No special provision is made in Europe for sectarian education in medicine. Every intending practitioner is required to conform to the law. He must meet the requirements as to preliminary education. He must follow the regular course of medical instruction, and he must pass the requisite examinations. Having done so, he is free to call himself any kind of doctor that he chooses. As a matter of fact, it is found that, having complied with the usual requirements, only a negligible fraction prefer a sectarian designation.

Very different is the situation in the United States in this respect. There are in the United States some thirty sectarian institutions, about a dozen of them homeopathic, half a dozen eclectic, and the rest osteopathic. These schools have low entrance requirements, poor laboratory facilities, and almost without exception feeble clinical facilities. In general, the eclectic and the osteopathic schools are more wretched than the homeopathic. For the benefit of these institutions separate state boards are at times created, and their graduates are enabled to enter the practice of medicine on easier terms than are applied to the graduates of regular schools. Despite the fact that the laws deal with them favorably, sectarian schools are on the decline.

Postgraduate Instruction. — The rapid progress of medicine in recent years makes it advisable for men engaged in practice to make some systematic effort to keep in touch with recent development from time to time. This has led to the institution of postgraduate instruction in almost all parts of the world. In Germany postgraduate instruction takes one of several forms. The so-called Central Committee for postgraduate medical education, established in 1900, organizes lecture and laboratory courses in all the leading German cities annually. These are meant for the benefit of practitioners who cannot leave home in order to engage in study elsewhere. The local courses are free of charge and are conducted partly by local physicians, partly by lecturers from other towns. The courses vary in character. Sometimes successive weekly addresses on different topics are given by different lecturers; again weekly clinics may be held; again practical courses are instituted, requiring two or three hours weekly and lasting two or three months. In the university towns the university instructors often offer continuation courses four weeks in length, dealing with all the newer topics likely to interest the practitioner. At Köln and Düsseldorf academies of practical medicine have been created, though they have thus far amounted to little more than the local establishments previously described. In addition to these more or less organized opportunities, postgraduate work can be procured in every German and Austrian university. Many courses are announced in the catalogues, but not infrequently practitioners, native and foreign, combine to request particular courses, arrangements for which can always be easily made. Little special provision for this sort of graduate study is made in Great Britain or France, though visitors are always welcome to the clinics in both countries. In Paris especially the rounds of well-known physicians are daily followed throughout the year by throngs of visitors. In London a Postgraduate Association has been formed which sells a composition ticket admitting to all clinics, clinical lectures, operations, and autopsies of the constituent hospitals. The most active seats of postgraduate training in England are the schools of tropical medicine in Liverpool and London.

In America the postgraduate school may be characterized as a compensatory adjustment. It is an effort to mend a machine that was predestined to break down. The more conscientious and intelligent men trained in the American medical schools above described were bound to become aware of their unfitness for the responsibilities of medical practice. The postgraduate school was therefore established to do what the medical school had failed to accomplish. Thirteen such institutions exist in the United States, of which those in New York and Philadelphia command good teaching hospitals. Their instruction is immediately practical in character, and has little to offer the well trained undergraduate student, who will do better to resort to a university for such additional opportunity as he wishes. It seems not improbable that the improvement of medical education in America may cut the ground out from under the postgraduate school as it has been here developed.

Medical Education of Women. — Access to the medical faculty on the same terms enjoyed by men was granted to women by the Swiss universities in 1876. The constituent states of the German Empire one by one adopted the same policy. Women have been admitted to the medical faculty of the Prussian universities on the same terms as men since 1908. The number of women students of medicine in Germany is, however, still small (241 in the summer semester of 1910), the reason being that secondary school facilities have not yet been provided in sufficient abundance. In Great Britain a medical school for women was established in London in 1874, — the London School of Medicine for Women, through which nearly one thousand students have passed since its opening. The other hospital schools of London exclude women. Of the provincial universities Durham, Manchester, Liverpool, Birmingham, Leeds, and Bristol are coeducational, as are Aberdeen and Dundee in Scotland. Edinburgh examines, but does not teach, women students of medicine. Glasgow teaches them in a separate establishment. In the United States both women's medical schools and coeducational medical schools exist. There were in 1909, 91 medical schools admitting both men and women, three admitting women alone. Of 921 women students in that year 752 attended coeducational institutions; 169 attended women's medical schools.

Medical Education of the Negro. — The medical education of the negro is, particularly in the southern part of the United States, a matter of urgent importance. The relations of the two races are such that both suffer in point of health if either is neglected. A considerable supply of well trained negro physicians needs, therefore, to be procured. For this purpose there exist now in the United States six medical schools for negroes, but of these six only two — one at Howard University, Washington, D.C., the other Meharry Medical College at Nashville — are in position to give a fair training in medicine. A. F.

For existing conditions in medical education in other countries, see the articles on education in the respective countries; *e.g.* BELGIUM, EDUCATION IN; NETHERLANDS, EDUCATION IN; etc.

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Germany and Austria. — From the *Vorlesungs-Verzeichnisse der Universitäten von Deutschland, Oesterreich und der Schweiz,* published twice yearly by the *Akademischer Verlag, München.* This publication includes the announced courses of all universities. Each university also publishes its own catalogues: *Vorlesung-Verzeichniss* (lectures) and *Personal-Verzeichniss* (list of professors and students). Physicians desiring post graduate opportunities should consult the program of the *Dozenten-Vereinigung* of Berlin, the publications of the Kaiserin Friedrich Haus, Luisenplatz, Berlin, and the Anglo-American Medical Association, Berlin, and one of the following: —

Karger, *Das Medizinische Berlin;* G. Mamlock, *Wegweiser für Aerzte;* J. Pagel, *Aerzteführer durch Berlin.* As to Vienna see *Aerztliche Fortbildungkurse,* published by Urban and Schwarzenberg.

Great Britain. — The two leading London medical journals, *The Lancet* and the *British Medical Journal,* publish annually in August or September "Educational Numbers," containing full information respecting all British medical schools, examinations, etc. Every school issues a calendar.

France. — An English Handbook to the Paris Medical School by A. A. Warden (London, 1903).

Livret de l'Etudiant L'Université de Paris — obtainable from the Bureau des Renseignements à la Sorbonne, 47 Rue des Écoles, Paris.

Programmes-Généraux des Cours et Conférences. Imprimerie Chaix, Boulevard St. Michel.

Every university issues its own *Livret de l' Étudiant.*

America. — *The Journal of the American Medical Association* (Chicago) publishes annually in August an "Educational Number," giving full information respecting all American medical schools. The Council on Education of the American Medical Association (Chicago) also publishes a large number of pamphlets dealings with the same topic. Every medical school issues a catalogue.

MEDICAL INSPECTION OF SCHOOLS. — Medical inspection is an extension of the activities of the school in which the educator and the physician join hands to insure for each child such conditions of health and vitality as will best enable him to take full advantage of the free education offered by the State. Its object is to improve health conditions among school children, safeguard them from disease, and render them healthier, happier, and more vigorous. It is founded on a recognition of the intimate relationship between the physical and mental conditions of the children and the consequent dependence of education on health conditions. Systems of medical inspection have been in existence for some eighty years, but it is during the past quarter of a century that its rapid and world-wide spread has taken place. It is now a movement, national in scope, in most of the important countries of the world. It is found in all of the continents, and the extent of its development in different countries is, in some measure, proportionate to their educational enlightenment.

Status in Different Countries. — *France.* — The first work seems to have been done in France, where the law of 1833 and the Royal Ordinance of 1837 charged school authorities with the duty of providing for the sanitary condition of school premises and supervising the health of school children. A few years later, in 1842 and 1843, decrees were promulgated directing that every public school should be regularly inspected by a physician. Despite these early beginnings, genuine medical inspection, in the modern sense of the term, was not begun in France until 1879, when the work was organized in Paris. Eight years later medical and sanitary inspection were made obligatory in all French schools, public and private.

At the present time, medical inspection in Paris is carried on by a corps of 210 school physicians, who are selected by competitive examinations, and each of whom has supervision over not more than 1000 children. At least twice each month these doctors visit each school and make careful examinations of the sanitary conditions of the premises, giving special attention to lighting, ventilation, cleanliness, and water supply. After this, a visit is made to each classroom, and the children are selected who appear to need special attention. After this general inspection, individual examinations of children are conducted in the inspector's private room. Three classes of children are examined: first, those whom the doctor has selected as appearing to need special attention; second, those referred to him by the teachers and masters; and, third, those who have returned to school after absence from unknown cause. Each child is given a thorough physical examination during the first months of school life, and a complete record of the results is entered on an individual record sheet, which follows the child through his subsequent school career. Measurements of height and weight are made every six months, and entered on these sheets, together with records of illnesses and the results of physical examinations. Parents are informed of any defects or diseases discovered, and urged to secure remedial treatment. In the other cities of France the systems followed are based on that of Paris, but are in general less thorough, and in the smaller places are mostly restricted to measures for the prevention of contagious diseases.

Germany. — Dresden began work in 1867, when vision tests were instituted. Frankfort-on-the-Main appointed a school doctor in 1888, and the example was rapidly followed by other cities. Wiesbaden soon developed a plan that was widely copied and became a model for the work throughout the empire. The procedure followed by the school doctor on his monthly visits to each school closely resembles that already described as followed in Paris. General inspections of premises and classrooms are first made, followed by individual examinations of selected pupils. Each child is given a physical examination before first entering school, and subsequent ones in the second, fourth, sixth, and eighth years of school life. A record sheet is kept for each child, and parents are notified of the results of the examinations.

There is wide variation in the thoroughness of medical inspection in different parts of the empire. Thoroughly organized systems under state regulation exist only in Saxe-Meiningen and Hesse-Darmstadt, where every school, both public and private, in the country as well as in the city, is provided with a state-appointed doctor. In other states, the school doctors are appointed by and work under the municipal *Magistrat*, the local board of education, or the board of health. In 1908 some 400 towns and cities had systems of medical school inspection, employing about 1600 physicians. Three plans of employing and remunerating these school doctors are common. Under the first, the physician is employed on full time, and is paid a salary ranging from $1750 to $2750 per annum, and has the right to a pension. Under the second plan, a salary of from $150 to $250 a year is paid for part-time services, and the work is usually carried on in addition to other public health services, for which separate payment is made. The third plan is to pay on a per capita basis according to the number of children inspected, and the scale of payment ranges from six cents to fifteen cents per child per year, the average being about twelve cents. Payment is also sometimes made at the rate of sixty cents to one dollar for each class examined. As yet there are only a few school nurses in Germany, Charlottenburg and Stuttgart being the only cities which employ them. Other movements, however, closely allied to medical inspection, such as school feeding (*q.v.*) and the provision of special classes for exceptional children, have made notable progress. (See Germany, Education in.)

Great Britain. — The medical inspection of schools and scholars is carried on under the provision of the Education Act of 1907, which is mandatory in its nature and applies to the schools of England and Wales. In Scotland it is carried on under the Education Act of 1908, which went into force at the beginning of 1909, and conferred on school boards powers necessary for a universal system of medical inspection. In Ireland compulsory medical inspection does not exist. Such as is carried on, is mainly performed by the school inspectors of the National Board, who are not medical men. The object of medical inspection in Great Britain, as stated in the *Memorandum* of the Board of Education, is " to secure for every child, normal or defective, conditions of health compatible with that full and effective development of its organic functions, its special senses, and its mental powers, which constitutes true education."

Although London began medical inspection in England by the appointment of a school physician in 1891, the movement was only sporadic in its development up to the passage of the act of 1907, making it universal and compulsory. The details of organization are in the main left in the hands of the local authorities, although some minimum requirements are laid down by the *Memorandum* of the Board of Education. These provisions include the physical examination of each child at the time of its entrance to a public elementary school, and at least three subsequent examinations. The first of these takes place during the third year of school life, or about the seventh year of age; the second during the sixth year of school life, or about the tenth year of age; and the third at the time the child is about to leave school and go to work.

School nurses were first employed in England, where their work in London dates back as far as 1887. The first school nurses, in the newer acceptance of the term, were appointed in 1901 by the London School Board, and their employment is now becoming general in other cities.

Other Countries. — In Norway, the movement has progressed steadily since 1885, when some localities supported regular school physicians. Permissive regulations were passed in 1889, and two years later obligatory ones were adopted. Sweden is probably the country where the term " school physician " was first employed in its modern sense. As far back as 1868, medical officers were attached to the staff of each large school. Their duties and spheres of activity have been greatly extended, beginning first with the higher, and since 1895 including the primary schools. Denmark has no regular system of medical inspection, nor any legislation directly providing for it. There is, however, a certain amount of work carried on in the elementary and secondary schools of the larger towns and cities. Austria was the first country to enact effective legislation covering inspection in elementary schools. This was done through the ministerial decree of 1873, providing for the regular employment of school physicians. In Hungary, the act of 1885 established the office of school physician. In Switzerland, the medical examination of children is recommended by the Federal government, but not enforced. Nevertheless some thirteen cantons carry out the recommended inspection, and in some cities very thorough work is done by the school doctors. Russia has made provision for medical inspection since 1871, but with the exception of a few cases it has not extended beyond the secondary and higher schools. In Bulgaria organized work dates from 1904, while in Roumania adequate legislation has existed since 1899.

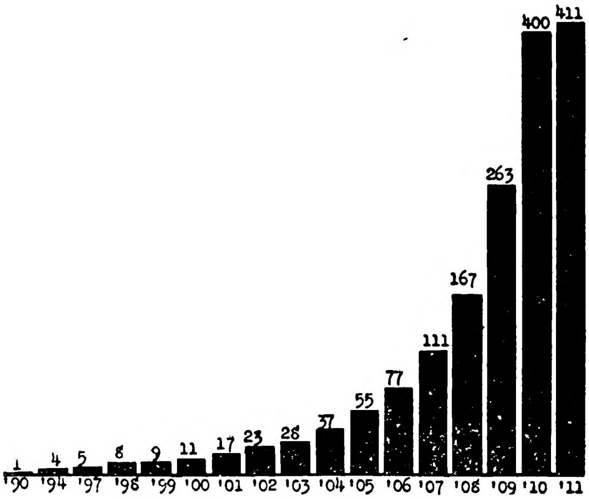
In Belgium, medical inspection is the rule in the more important municipalities, and Brussels is credited with establishing the first system of medical inspection, in the full modern sense of the term, in 1874, when school physicians were appointed who inspected each school three times a month. From its inception the system was remarkably successful, and was copied in other Belgian cities and served as a model for systems in Switzerland. Some of the earliest work of school dentists and oculists was done in Brussels.

A number of countries in America, outside the United States, have more or less well developed systems of medical inspection. In Canada, Montreal began work in 1906, when fifty school physicians were appointed. This was followed by work undertaken in Halifax and Vancouver in 1907. Some work is being done in all of the provinces, and there is legislation providing for its existence in Ontario, Manitoba, and Alberta. Medical Inspection in Mexico dates from 1896, when the Department of Medical Inspection and School Hygiene was organized under the Director-General of Elementary Instruction, and a few doctors were appointed. Since that time there have been numerous reorganizations, and a constant extension of the system, until it is now very complete and notably efficient in the city of Mexico and its suburbs. The work has spread until it is fully organized in the state of Chihuahua, and partly so in Guanajuato and San Luis Potosí.

In South America, the Argentine Republic and Chile both began medical inspection of schools in 1888, and in both republics the systems are very thoroughly developed. The work in Australia, Tasmania, and New Zealand dates from 1906, and includes not only preventive measures, but much scientific study of the results of the examinations. This renders the reports from these states unusually valuable. In Japan, medical inspection has been compulsory and universal since 1898. Only small towns and country districts are exempted. In Cairo, Egypt, the first school physician was appointed in 1882, and the system has been continued ever since.

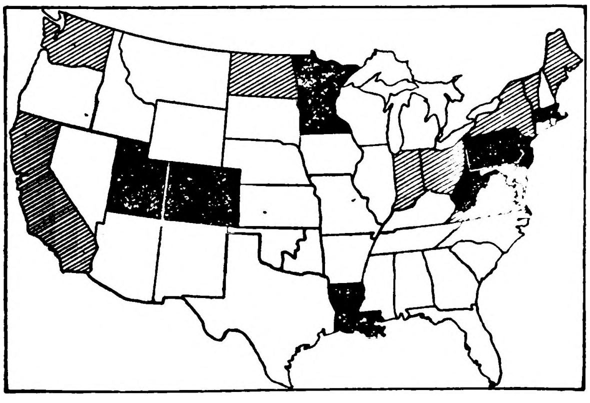
United States. — Boston was the first city in the United States to establish a regular system of medical inspection. This was in the year 1894, and came as a result of a series of epidemics among the school children. New York City followed in 1897, when 134 school physicians were appointed. Chicago and Philadelphia began work in 1895 and 1898, respectively. In all of these instances medical inspection had in its inception the sole object of reducing the number of cases of contagious diseases among the pupils.

From the greater cities, the movement rapidly spread to the smaller ones, the first step in most cases being taken by a local medical society offering to carry on volunteer work for a limited time to demonstrate its desirability.



Number of Cities in the United States having Systems of Medical Inspection (1890–1911).

During the school year 1910–1911 an extensive study undertaken by the Russell Sage Foundation, and covering 1038 cities, including nearly 90 per cent of the municipalities having regularly organized systems of public schools under superintendents, showed that in 443 cities there were systems of medical inspection in force. In other words, regularly organized systems of medical inspection constitute an integral feature of the school systems in 43 per cent of the cities of the United States. The preceding chart represents graphically the number of cities having systems of medical inspection each year since 1894, and shows how the growth of the movement has been at first slow and gradual, and, in the last few years, increasingly rapid. It presents the facts for



Medical Inspection Laws in 1911.

States having mandatory laws, in black;
Those having permissive laws, in cross hatch;
Those having no laws, in outline.

the 411 cities, from which it was possible to secure information as to the date of beginning medical inspection.

The tabulated returns of the study above referred to show that the adoption of medical inspection of schools has been more general in the cities of the North Atlantic and Western than in the Central and Southern states. In the North Atlantic states 58 per cent of the cities have systems of medical inspection, in the South Atlantic group 31 per cent, in the South Central states 35 per cent, in the North Central division only 29 per cent, and in the Western states 57 per cent. In compiling these data the states have been grouped by divisions according to the standard adopted by the Bureau of the United States Census.

Medical inspection as now carried on in American schools may be divided into three classes of work. The first is inspection for the detection of cases of contagious disease. The second consists of examinations conducted by the teachers themselves to detect defective vision and hearing. The third comprises complete physical examinations of the pupils to detect physical defects and organic diseases.

Inspection for the Detection of Contagious Disease. — Where there is any sort of medical inspection it is nearly invariably true that inspection for the detection of contagious diseases is included as one of the most important items. Indeed, there are many cities where this is the only work carried on. Its object is primarily the protection of the community, and because of this the work is often conducted by physicians of the board of health. In most cities the inspectors call daily at the schools to which they are assigned and examine such pupils as are referred to them by the teachers and principals. These pupils include all who have returned to school after being absent on account of illness or from unknown causes as well as those who are in school and suspected of suffering from some infectious or contagious ailment. In most cities examinations are made for the following diseases: Scarlet fever, diphtheria, measles, smallpox, chicken pox, tonsilitis, pediculosis, ringworm, impetigo contagiosa, trachoma, and other transmissible diseases of the skin, scalp, and eye. Tuberculosis, when thought to be far enough advanced to be a menace to public health, is generally reported to the chief medical inspector before excluding the pupil from school. (For further discussion, see CONTAGIOUS DISEASES; INFECTIOUS DISEASES.)

When children are excluded, brief but sufficient reason therefor is written on an exclusion card, which is sent to the parents. One copy is filed with the school authorities, and one with the board of health. School physicians are forbidden to make any suggestions as to treatment and management of the pupils who are sick. This rule is nearly universal, and is made imperative.

Vision and Hearing Tests. — The policy of legislators and school administrators in arranging to have tests for sight and hearing conducted by school teachers themselves rather than by specialists has occasioned many expressions of surprise and no little criticism. This policy, however, has reached its present wide development on the recommendations of specialists themselves who deem that such tests are wholly within the capacity of the teacher. It is their opinion that children are subjected to less nervous strain when tested by their teachers than when tested by strangers, and, therefore, exhibit themselves in a more natural way. It is always the intention, however, wherever this policy is followed, to have scientific examinations made by specialists in cases where defects are apparently revealed by the teachers' tests.

Work of this sort has greatly increased since the action of the state legislature of Massachusetts in 1906 in passing a medical inspection law containing mandatory provisions by which vision and hearing tests are conducted by the teachers. During the hearings on the Medical Inspection Bill a mass of evidence was presented by experts bearing upon the question of the feasibility of such tests. (For further discussion see EAR, section on Tests of Hearing; and EYE, section on Tests of Vision.)

Physical Examinations. — Municipal and educational authorities in America have very generally realized that the theory on which physical examinations are conducted rests on a different foundation from that underlying medical inspection for contagious diseases. Historically, physical examinations have usually followed, and almost never preceded, the inception of inspections for the detection of contagious disease. The latter is primarily a protective measure, and looks mainly to the present safeguarding of the community. The former aims at securing the physical soundness and strength of the individual, and looks far into the future. It has been brought into being by successive results of a long series of studies which have shown that there are many physical defects which are common among children and have an important bearing on their present health and future development, and may be easily remedied or modified, if they are discovered early enough. Moreover, these studies have demonstrated that without a system of medical inspection only a small minority of these defects are discovered by teachers or known to them, to the parents, or to the children themselves.

The following is a copy of the record card which is in use in New York City to record the results of the individual physical examinations of pupils. By referring to the headings under which the entries are made we may see what the defects are which the school physicians search for and record if discovered. The list for New York City is not very different from the list commonly employed in other parts of the country. It may be regarded as typical.

PHYSICAL RECORD. NEW YORK CITY

Name ____________________
Born ____________________
Nationality of Father __________ Mother __________
Number in Family, Adults __________ Children __________
Number of Birth __________ History of Measles __________
Scarlet Fever ______ Diphtheria ______ Pertussis ______
Pneumonia __________ Grippe __________
Date of 1st Examination ____________________
in School ____________________

	1		2		3, etc.	
	1	2	1	2	1	2
1. School year						
2. Term						
3. Class						
4. Revaccinations						
5. Diseases during term						
6. Date of physical examinations						
7. Defective vision						
8. Defective hearing						
9. Defective nasal breathing						
10. Hypertrophied tonsils						
11. Tubercular lymph nodes						
12. Pulmonary disease						
13. Cardiac disease						
14. Chorea						
15. Orthopedic defect						
16. Malnutrition						
17. Defective teeth						
18. Defective palate						
19. Height						
20. Weight						
21. Mentality						
22. Effort						
23. Proficiency						

The most extensive results yet secured in the United States as to the physical conditions of school children are those from the examinations conducted by the board of health in New York City. The results for the year 1908, as published in the *Report* of the City Superintendent of Schools for that year, are as follows: —

	TOTAL	PERCENTAGE
Number of children examined	252,254	100
Found to have no defects	65,616	26
Found to be defective	186,638	74
Found to be suffering from:		
Malnutrition	8,054	3.2
Chorea	821	.3
Tubercular lymph nodes	997	.4
Cardiac diseases	1,964	.8
Pulmonary diseases	673	.3
Skin diseases	4,115	1.6
Orthopedic defects	1,728	.7
Defect of vision	26,224	10.4
Defect of hearing	2,287	.9
Defect of nasal breathing	36,099	14.3
Defect of palate	897	.4
Defect of teeth	135,166	53.6
Hypertrophied tonsils	44,889	17.8
Defective mentality	691	.3

The School Nurse. — The school nurse is now considered to be one of the most necessary adjuncts of the better developed systems of medical inspection. The total number employed in American cities at the beginning of the year 1911 is 415, of which 375, or 90 per cent, are in the North Atlantic and North Central States.

The first regular employment of trained nurses in connection with the work of medical examination was begun in New York City in December, 1902, when a corps of nurses was established at a salary of seventy-five dollars per month each. Since that time experience has proved, especially in the largest cities, that the employment of competent school nurses is almost a necessity. The nurses are especially valuable in reducing the number of exclusions of children from school on account of minor illnesses. Many of these when properly treated by the nurse in school do not prevent the regular attendance of the child. The trained nurse greatly enhances the success of the work of the school physician in improving the health of the school children. She aids the school teacher in detecting the first signs of approaching illness. She sees to it that all excluded cases are placed under treatment as soon as may be, so that there is the least possible loss of time from school and interference with education. She treats those cases which would for various reasons receive no attention at their homes. She assists the school physician in the clerical work of recording the results of the physical examinations which he conducts.

In many cases it is also found feasible to employ the nurses during the summer months, when there is no school, in work directed to the lessening of the great mortality rate among infants from summer diarrhea, due mainly to improper care and feeding. Again, she aids materially in the anti-tuberculosis campaign. About a quarter of the cities having any sort of medical inspection employ school nurses, and the number is increasing rapidly. To sum up the case for the school nurse: she is the instructor of parents, pupils, teachers, and all members of the family in the principles and practices of hygiene. She is a most efficient link between the school and the home.

Dental Inspection. — Increasing attention is being given to the inspection of children's teeth in American schools, and the work is being more and more commonly carried on as a branch of medical inspection in a semi-independent way. (See TEETH, CARE OF AMONG SCHOOL CHILDREN.)

Summary of Conditions in the United States. — Reference has been made to the study of the status of medical inspection which included 90 per cent of the cities of the United States having school systems organized under superintendents of schools and which brought together the data as to the status of the movement in the spring of 1911. The following is a brief summary of conditions as revealed by that study.

	Number	Per Cent
Cities from which returns were secured	1038	100
Having systems of medical inspection	443	43
Having inspection for the detection of contagious diseases	405	39
Having vision and hearing tests by teachers	552	54
Having vision and hearing tests by physicians	258	25
Having complete physical examinations	214	21
Having dental inspection by dentists	69	7

	Number
Systems administered by boards of education	337
Systems administered by boards of health	106
Number of school physicians employed	1415
Number of school nurses employed	415

Administration. — There are two standard types of administration, that under the Board of Health and that under the Board of Education. In the early days of medical inspection practically all the systems were administered by local boards of health, but in recent years the tide has turned the other way, until at the present time about one quarter of the cities have systems under their boards of health, and in the remaining three quarters the board of education is the controlling body. According to the best American practice there should be one medical inspector and one nurse for each 2000 pupils in cities where the nurse and physician are employed on full time and the schools are so large and so close together as to reduce to a minimum the time spent in going from one building to another. These figures must be radically altered for rural districts.

Salaries. — Professor William Osler is credited with saying with regard to the work of medical inspection in England, "If we are to have school inspection let us have good men to do the work, and let us pay them well. It will demand a special training and a careful technique." It is certainly to be regretted that this point of view has not been more generally taken in America. In this country the financial remuneration of school physicians and school nurses is almost invariably inadequate. The salaries paid range from nothing to $4000 per annum. In many localities the local medical association conducts medical inspection for a year or two without cost to the city in order to demonstrate its value. This results in the tabulated returns showing that in a considerable number of cities the doctors and nurses receive no pay at all for their services. It may also be a factor in bringing about the extremely low salaries that are received after regular payment is given. The following table is made up from the study of conditions in 1038 cities, and shows the number of localities in which the salaries of doctors and nurses fall within the salary limits named in each group. That is to say, the first line shows that there are seventy-five cities in which the doctors donate their services and twenty-one in which the school nurses do the same. The second line indicates that there are forty-seven cities in which the salaries paid to the doctors are between $1 and $100 per annum.

	No. of Cities where Doctors Receive Salary Indicated	No. of Cities where Nurses Receive Salary Indicated
No salary	75	21
$1–100	47	—
101–200	50	—
201–300	44	2
301–400	25	—
401–500	24	1
501–600	18	21
601–700	2	17
701–800	12	24
801–900	6	15
901–1000	13	2
1001–1500	18	2
1501–2500	7	—
2500–4000	3	—
Fees according to service	19	1

The table shows that there are more cities paying their school physician at the rate of between $100 and $200 per year than there are paying salaries of any other amount. On the other hand, the average salary is somewhat higher than this. If computed on the basis of the table and without taking into account the number of doctors employed in each individual city, the average salary would fall within the group receiving from $201 to $300 per annum. In a similar way the second column of the table shows that there are more cities paying their school nurses from $701 to $800 per annum than there are paying any other salary, but the average salary would be about $700 per year. Of course the sum of $200 per annum is given in return for only a part of the school doctors' time. Nevertheless it has come to be regarded as a somewhat standard rate of remuneration for school physicians all over America. There are cases where so little work is required that this amount may be considered adequate, but undoubtedly in most cases it represents an undue degree of sacrifice on the part of the school physician.

Cost and Time. — The per capita cost of medical inspection for salaries alone ranges from about one-half of one cent for vision and hearing examinations conducted by teachers to about $1.25 for complete physical examinations in a few localities. These extremes, however, do not at all represent average conditions. In general the per capita cost of medical inspection in America ranges from ten to fifty cents per annum. It seems to be a fair generalization to say that medical inspection for the detection of contagious diseases can be adequately performed at an annual cost of about fifteen cents per capita, while physical examinations similarly performed and including the inspection for the detection of communicable disease cost about fifty cents. Physical examinations for the detection of non-contagious physical defects can be made by an experienced school physician in about twelve to fifteen minutes per child. Vision and hearing tests alone demand from three to five minutes per child. Systems of medical inspection which include careful physical examinations of all children cost the most and are by far the most valuable. From a social and economic point of view they are by far the cheapest in the better sense of the word, as they are the most far-reaching, both in their immediate and indirect results. Permanent efficiency requires skilled workers, careful administration, and adequate remuneration.

Legal Provisions in the United States. — The first state law providing for the medical inspection of school children appears to have been passed by Connecticut in 1899. It did not provide for the complete sort of inspection now carried on in many cities and states, but only for the testing of eyesight by teachers every three years. Complete medical inspection with examinations for the detection of physical defects was first provided for by state enactment in the permissive law of New Jersey passed in 1903. This was followed by the mandatory law of Massachusetts in 1906, which has been several times amended and has served as the basis for a majority of the bills which have since been presented in other state legislatures. At the present time (June, 1911) seven states have mandatory laws, ten have permissive ones, and in two states and the District of Columbia medical inspection is carried on under regulations promulgated by the boards of health and having the force of law. The map on page 184 shows graphically which states have mandatory laws, which permissive ones, and in which states there are no laws at all.

The past five years have furnished a large body of experience under varying conditions in widely separated localities. The lessons of this experience can be read in the substantial agreement of a majority of the laws in several salient features. This is graphically shown by the following tabular presentation of the principal features of the different laws and regulations.

PRINCIPAL FEATURES OF STATE LAWS AND REGULATIONS PROVIDING FOR MEDICAL INSPECTION, 1911

No.	State	Date Adopted	Permissive or Mandatory	Administered by School or Health Authorities	Inspection by Doctors for Contagious Diseases	Physical Examinations by Doctors	Inspection of Teachers, Janitors, and Buildings by Doctors	Sight and Hearing Tests by Teachers	Normal Pupils Trained in Tests of Sight and Hearing	Provision for Employment of Nurses	Penalty for Violation of Law	Parents Compelled to Remedy Condition Discovered
1	California	1909	P	S								
2	Colorado	1909	M	S				*				
3	Connecticut	1907	P	S	*	*	*			*		
4	District of Columbia	1907	M	H	*		*					
5	Indiana	1911	P	S	*	*	*	*			*	
6	Louisiana	1911	M	S								
7	Maine	1909	P	S	*	*	*	*				
8	Massachusetts	1906	M	S or H	*	*	*	*	*			
9	Minnesota	1910	M	H	*	*	*	*	*			
10	New Jersey	1909	M	S	*	*						*
11	New York	1910	P	S								
12	North Dakota	1911	P	S		*						
13	Ohio	1910	P	S	*		*			*		
14	Pennsylvania	1911	M	S	*	*	*			*		
15	Rhode Island	1911	M	S	*	*	*	*				
16	Utah	1911	M	S		*		*				
17	Vermont	1910	P	S	*							
18	Virginia	1910	P	S								
19	Washington	1909	P	S	*		*					
20	West Virginia	1911	M	S	*	*	*			*		

On four points there is substantial agreement. The first is that the administration of the provisions of the law is placed in the hands of the school authorities. The second, third, and fourth are respectively the placing in the hands of school physicians the inspection of contagious diseases, the physical examinations, and the inspection of teachers, janitors, and build-

ings. In six cases the provision is made for testing of vision and hearing by the teachers.
L. P. A.

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MEDULLA. — See Nervous System.

MEGALOMANIA. — This is a symptom in various mental diseases which is indicative of a feeling of well-being. The individual believes he is capable of doing more than usual, and often more than he is capable of doing. Associated with it there are usually delusions of great wealth and supernatural powers, sometimes of divinity, and occasionally this develops upon a basis of depression. The symptom is found in mania (*q.v.*), in paresis (*q.v.*), and in dementia precox (*q.v.*). It is typical of paranoia, but we now know that paranoia (*q.v.*) is the rarest of mental diseases. This feeling of well-being is probably to be associated with the day dreaming and feeling of power and wealth of children, and these ideas of children very likely are based upon the same sort of mental processes as those of the insane.
S. I. F.

See Mania.

MEIEROTTO, JOHANN HEINRICH LUDWIG (1742–1800). — German scholar and rector of the Joachimstal Gymnasium at Berlin. He strongly supported the attitude of Frederick the Great (*q.v.*) on secondary education. While he recognized the impossibility of teaching Latin as a spoken language, although Latin and Greek were still subjects studied by all pupils, he did not neglect German grammar and literature, history and geography. Some attention was paid to mathematics, but none to modern languages. He became a member of the Academy, of the Supreme Council of Schools, and of the Consistory of Berlin. He wrote many works on classical subjects, among them being *Manners and Customs of the Romans at different Periods of the Republic* (1778–1779); *De educatione et institutione quam M. T. Cicero in erudiendo filio Marco secutus est* (1784); *Grammatici est aliquid nescire* (1785); *De praecipuis Romanorum auctoribus ac primum de Taciti moribus* (1790); *De Sallustii moribus* (1792).

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MEIKLEJOHN, JOHN MILLER DOW (1830–1902). — Professor of Education at St. Andrews University, Scotland. He was the son of a private schoolmaster in Edinburgh, and after being educated by him he entered the University of Edinburgh. On graduating he taught for several years in schools near Manchester and London. He contributed frequently to the press, and in 1864 was war correspondent in the Danish-German War. In 1874 he was assistant commissioner on the Endowed School Commission, and in 1876 was appointed to one of the first chairs of education in Great Britain, founded simultaneously at Edinburgh and St. Andrews under the Bell Educational Trust. In this position Professor Meiklejohn showed a high conception of his duties and of the difficulties before him in view of the fact that there were scarcely any textbooks at all on the subject in England. The problem of education he conceived to be "how to train a child to healthy activity, to self-help, to a harmonious development of its powers of body and mind." He was opposed to the dry mechanical methods which prevailed in the schools of his day, and one of his chief contributions was a series of school textbooks which laid emphasis on a rich content. Among these may be mentioned: *Brief History of the English Language and Literature*; *British Empire, its Geography, Resources, Landways and Waterways*; *New Geography on the Comparative Method*; *English Language, its Grammar, History, and Literature; English Readers.* He also translated Kant's *Kritik der reinen Vernunft*, and wrote a memoir on *An Old Educational Reformer, Dr. Andrew Bell.* His conception of the function of a professor of education is well stated in his inaugural address in 1876 (see Barnard, *Am. Jour. of Ed.*, Vol. XXVIII, pp. 220–224) and in the *Training of Teachers and the Chair of Education in the University of St. Andrews* (1879).

MELANCHOLIA. — A term used to indicate (1) a symptom corresponding with a feeling of sadness or depression, or (2) the association of a number of symptoms making a specific type of disease; (*a*) simple melancholia, in which there is the combination of depression, retardation, and a difficulty in thinking; (*b*) the agitated depression which is made up of depression with motor unrest and a difficulty in thinking; and (*c*) involution melancholia, or a melancholia occurring late in life. The various forms of melancholia, which are found in a variety of diseases, are probably only exaggerations of the normal feelings of sadness and depression, exaggerated under abnormal conditions. Lack of initiative, apparent stupor, due to general slowing of movement, bizarre ideas, are among the symptoms. The individual constantly thinks of methods to escape the depression, often ending in suicide. Recovery is usually not accompanied by mental deterioration. The first attack usually comes before the age of twenty, and in childhood is not as severe as in later life. The appearance of any or of all the symptoms in a child should be looked on with suspicion; advice properly given at the time of the first attack may ward off others. The symptoms in simple melancholia are so similar to those occurring after prolonged work that they have been explained as fatigue or exhaustion phenomena. The treatment consists of enforced rest; a building up of the body, and sometimes restraint, are necessary. In some cases considerable watchfulness is required to prevent the patient from committing suicide.

In agitated depression there is an emotional condition accompanied by lack of inhibition of movement, *e.g.* constant moving, picking at the face, wringing of the hands, tearing the hair, etc. This is typical of the cases of depression which are of sufficient intensity to need hospital treatment and restraint. Involution melancholia comes late in life, and has no educational interest. No symptom is so common in mental diseases as is depression, and it is not infrequent in physical diseases. This symptom should be the first to attract attention, and should cause the teacher to summon " first aid " assistance from the proper authorities in charge of the school health. S. I. F.

See CIRCULAR INSANITY; MANIA; OBSESSIONS; STUPOR.

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MELANCHTHON (SCHWARTZERD), PHILIP (1497-1560).—The great German reformer and humanist, the *Præceptor Germaniæ*, was born at Bretten, the son of an armorer. He received a careful education at home, and his ability attracted the interest of his uncle Reuchlin. Before proceeding to the University of Heidelberg he attended the Latin school at Pforzheim. At the university the humanist movement was not yet firmly established, but Melanchthon, in addition to official courses, devoted himself to the new studies. Graduating in 1511, he proceeded to the University of Tübingen, where he remained for six years, taking his M.A. in 1514. Here he studied not only the classics, but mathematics, astronomy (or better, astrology), physics, medicine, and Roman law. In his own hall or bursa he lectured on Vergil and Terence, and also gave lectures on eloquence and history. In 1518 he was called to the University of Wittenberg as teacher of Greek, and almost from the first began to exercise that influence which was to mold German education for more than a century. His inaugural address, *De corrigendis adolescentium studiis*, was a defense of humanism against its opponents, giving in brief a history of culture and an attack on scholasticism. Melanchthon urges the proper organization of studies based on grammar, dialectic, and rhetoric, and including mathematics, poetry, and oratory. The classical languages themselves are of importance as opening the sources of wisdom. In his address at the opening of the Nuremberg school he gives a more complete definition of his educational ideas: it is the divine purpose that children be trained to piety and virtue, and only through the sciences can religion and good laws be maintained; the sciences are a gift of God; hence impiety and ignorance go together. A similar statement was made by Melanchthon in connection with the school at Soest. At Wittenberg Melanchthon in 1519 became Bachelor of Theology. In addition to his public lectures, which in a very short time attracted students from all sides of Europe, he maintained a private preparatory school in his home, and thus had an opportunity of closely studying the requirements of a secondary school.

Melanchthon's influence lay in five directions: (1) as one of the most popular university teachers in Germany he trained a large number of young scholars who were spread over the country as teachers; (2) in visitation articles and whenever he made a visitation, he made direct suggestions for the erection of schools, beginning with the modest requirements of Latin, religion, and music; (3) as an organizer of schools, *e.g.* Eisleben, Magdeburg, Nuremberg, and Soest, he established a tradition which was followed elsewhere; (4) in the same way his influence was exercised on the German universities, *e.g.* Marburg, Königsberg, Jena, Frankfort-a.-O., Leipzig, Rostock, Heidelberg; some of these he helped to found, some he reorganized, some copied almost verbatim the organization of Wittenberg made in 1536; (5) almost as important as the other sources of his influence was Melanchthon's remarkable activity as an author of textbooks and editions of classical and theological works. As early as 1516 he edited the plays of Terence, but his first important work was the *Institutiones Græcæ Grammaticæ*, dealing with accidence, syntax, and etymology. In 1519 appeared his first work on rhetoric, *De Rhetorica Libri tres*, issued in 1520 as *Institutiones Rhe-*

toricæ, in 1531 as *Elementorum Rhetorices, Libri duo,* and again in 1542 under the last title with additions. The *Loci Communes,* 1521, was the first work on evangelical doctrine based on the Epistles of St. Paul. His Latin grammar, which appeared in 1522, attained great popularity and went through numerous editions. In 1523 appeared his plea for humanistic studies, including history, oratory, poetry, prose, verse, composition, and language, under the title *Encomium Eloquentiæ.* The *Enchiridion Elementorum Puerilium* (1524) was a handbook for beginners giving the alphabet, a number of prayers, and extracts from the Bible. A similar work for beginners of Greek was the *Institutio puerilis Literarum Græcarum* (1525). In 1530 he published a commentary on certain of Aristotle's political writings, followed in 1532 by a commentary on Aristotle. He also collaborated in a textbook on simple mathematics (1535). He had already expressed his interest in history by editing the *Chronicles* of Carion in 1532 and 1558–1560. In 1538 he published *Philosophiæ moralis Epitome,* an outline of his ethics, and in 1549 the *Initia Doctrinæ physicæ.* His collected works are contained in the *Corpus Reformatorum* by Bretschneider and Bindseil. His influence as a theologian cannot be better expressed than by stating that he was the author of the *Augsburg Confession* (1530), the *Brandenburg Reformation* (1539), and the *Wittenberg Reformation* (1545). How great a reputation was attained by Melanchthon is attested by the invitations not only to other German universities, but to France and England. But in spite of opponents the Preceptor of Germany remained at Wittenberg, devoted to the task of building up German Protestantism on a solid foundation of humanistic studies.

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MELBOURNE, UNIVERSITY OF, AUSTRALIA. — An institution endowed and incorporated by the Legislative Council of Victoria, Australia, in 1853 " to hold forth to all classes and denominations . . . encouragement for pursuing a regular and liberal course of education." Work was begun in 1855 with three professors and sixteen students and an annual government endowment of £9000, raised in 1904 to £11,000. From 1883 onwards there has also been added to the annual endowment a fluctuating sum granted by annual vote. The government of the university is in the hands of a council of twenty members elected by the senate, which consists of all male doctors or masters of the university. The council elects the chancellor and vice-chancellor of the university. A professional board considers all questions relating to studies and discipline. There are now the following faculties: law, medicine, engineering, arts, science, agriculture, veterinary science, and dentistry. There are further a department of education and a university conservatory of music. The following colleges are affiliated with the University: Trinity College (Anglican), Ormond College (Presbyterian), Queen's College (Methodist), and Australian College of Dentistry. In connection with the Training College of the Victoria Education Department, courses are given in education and lead to a university diploma. Evening courses are given leading to the following diplomas: education, agriculture, mining and metallurgy, and architecture. A department of university extension under the charge of a university extension board is also maintained. The enrollment of students in the university in 1910 was 1136 (345 arts and education; 34 science; 121 law; 60 engineering; 360 medicine; 65 dentistry; 23 agriculture; 92 music; 36 veterinary.)

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MELISH, JOHN (1770–1822). — Author of school geographies. He was educated in Scotland, but came to America in 1809. He published *Universal School Geography and Atlas* (1816), and books of travel on Great Britain, Canada, and the United States. W. S. M.

MELODY. — See Musical Terms.

MEMORIAL COLLEGE, MASON CITY, IA. — A coeducational and military institution, founded by the Sons of Veterans, U. S. A., in 1900, and maintaining a college, preparatory school, military academy, normal college, commercial college, school of oratory, college of music, and correspondence school. The entrance requirements are fifteen units. The A.B. and B.S. degrees are conferred.

MEMORY. — Memory may be defined as the return to consciousness of some experience, together with the awareness that it has been present earlier at a definite time and place. Four parts of the memory process need to be distinguished in the discussion. These are learning, retention, recall or revival, and recognition. The organic basis of memory is some change induced in the nervous system in learning that is retained in the organism as a disposition toward revival and is rearoused when a suitable incentive presents itself. The essentials of the memory process are the same as those involved in the formation of associations (*q.v.*).

Memory Types. — All memory may be conveniently divided into rote and logical memory. In rote memory the work must be done from the beginning, while in logical learning the new material is connected with the earlier acquired knowledge to constitute a well-ordered whole. Recent investigation has been devoted for the most part to determining the laws that control rote learning and the retention of materials learned by rote. To make sure that there has been no earlier partial learning and to get rid of all trace of logical learning, the experiments are ordinarily made with nonsense syllables made up of two consonants and an intervening vowel. These syllables are presented in series of twelve or sixteen by some mechanical device that insures that they shall be separated by regular intervals and exposed for a constant time. The adequacy of the learning is tested both by the number of repetitions required for the original learning and by the number of repetitions required for relearning after an interval. The accuracy of learning and retention may also be tested by determining the number of mistakes made in supplying the second member of a pair of syllables when the first of the pair is given, and also by measuring the time required to supply the second member. The first method is known as the method of relearning, or the saving method, the second as the method of successes. Both apply to the tests of retention rather than of the original learning.

Laws of Learning. — The results of these investigations may be briefly summarized in laws of learning and of forgetting. The laws of learning are: (1) Learning is a direct function of the number of repetitions. Each repetition increases the liability to retention by the same amount, whether the repetition be the first or the fiftieth. The repetitions after the series has been learned to the point where it can be said through without mistake are just as effective as the earlier ones. (2) Capacity for learning and for immediate retention increases with age up to the attainment of maturity, and then persists unchanged until the onset of senile degeneration. The only justification for the opposed popular belief is that it is probable that things once learned in youth will be retained more completely in later life. (3) Rhythm is an essential aid to learning. One cannot avoid some rhythm, and the more pleasant and easy the rhythm the easier and quicker is the learning. Syllables that belong to the same rhythmic unit are more closely connected than syllables that are contiguous in the series but belong to different groups. (4) When a series is learned, associations are formed not merely between contiguous memories, but between the noncontiguous memories of the series. The strength of the association is directly proportionate to the nearness of the members. (5) It is easier and quicker to learn a series by dividing the repetitions over several days than to make all the repetitions on one day. The more the repetitions are divided, the greater the saving. Any selection must be learned and forgotten several times, if it is to be permanently retained. The explanation is probably that the older associates are stronger, or more effective for reinstatement than the newer. In the interval between repetitions the connection between nervous elements grows stronger and thus does the work of added repetitions. (6) When a selection of any material is to be learned, it is more economical to learn it by reading through from beginning to end each time than to learn it by parts and then join the parts together. When learned stanza by stanza, for example, the first stanza will be repeated more often than is necessary before the latter parts are learned. Then, too, unnecessary associations are made between the end of each stanza and its beginning. These associates not merely waste time, but interfere with the correct associates at the moment of recall. The one disadvantage of the method is that one is likely to get discouraged after the reading has been repeated several times and to read more slowly, so that what is gained in the number of repetitions may be lost in time. To avoid this it is suggested that pauses should be made now and again at natural divisions, and then go on again from that point. This rests the learner without the disadvantages of learning by parts.

Retention. — The laws of retention have also been investigated by these methods. The associations once formed tend to disappear more or less gradually, and it is important to know the course of their disappearance. The laws that have been determined for the disappearance of associations and the processes that aid and retard the process may be stated in brief form. (1) Forgetting goes on rapidly at first, and then very slowly. Meumann found that 30 per cent was forgotten the first hour, 32 per cent in twenty-four hours, 50 per cent in six days, 80 per cent in 30 days, and 97 per cent in 120 days. Forgetting is much slower for sense material than for nonsense syllables. Ebbinghaus found that with poetry 7 per cent was retained after twenty-two years. (2) Associations persist longer if no other work is done for five or six minutes after learning is completed. Other activity seems to interfere with the " setting " of the associations that was referred to above. (3) If a syllable has been learned in one connection, it is more difficult to learn it in another connection than if it had not been learned before. One associative connection seems to check the formation of others. (4) If two associates have been formed with the same syllable, it is more difficult to reinstate either than if that were the only one. Both of these last laws hold only for associations that are only partially formed. If the first association is fully formed, it may help in the formation of the second.

In logical memory learning is quicker and forgetting is slower than in rote learning. Here the main thing is to understand, and when a statement is understood it is connected with general principles or meanings that have been developed earlier and have become so fixed through frequent repetition that they are never forgotten. Whenever a new fact is connected with one of these, it takes on much of the permanence of the meaning itself. It is learned at once, and will be remembered for an indefinite time. The course of forgetting is much slower than for the material learned by rote.

Recall. — The laws of recall are the laws of association. What shall be recalled at any moment depends upon the cue provided by the environment or the train of thought, the connections that cue has made earlier, and the attitude that dominates at the moment. It should be said that recall is very seldom of the particular images that were earlier experienced; ordinarily one recalls meanings. One remembers that certain events happened and remembers the fact on the basis of very schematic imagery. Memory is not a mere reinstatement of an earlier process, but is a representation of the event in some other terms. This fact that meaning and image may be altogether unrelated is very evident from the difference in mental imagery. One person may remember everything visually, another in auditory or motor terms, and yet both may remember the same event with equal completeness.

Recognition, the assurance that the event recalled or the object seen has been appreciated before at a definite time or place, depends upon the associations and movements that it arouses when it presents itself. Other events that were associated with it are aroused, and these finally give it a setting in a definite time and place. The times and places that stand out prominently in the past, which serve as points of reference for the other events, are fixed through the frequency with which they have been recalled.

Mnemonics. — One problem much discussed in connection with memory is the advantage of artificial devices for improving the memory. One of the oldest is to connect anything to be recalled with some more familiar material. Thus dates may be represented by words by having certain consonants represent digits and then combining the letters into words and the words into sentences that can be readily remembered. Other systems make meaningless associations between two things to be recalled together. It must be said of all of these devices that they require more time than the simpler methods ordinarily used. The best mnemonic system is the system of knowledge as developed in the sciences. There everything is arranged in an order determined by long use and the best intellects. It is a logical system, and for bits of knowledge that fall within it no better system can be devised. Mnemonic systems are of value only for irrational matter, such as the number of days in the months. W. B. P.

See MNEMONICS.

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MEMORY MAPS. — Map drawing by the pupils, as an active mode of developing power to read maps, takes two forms: (1) map copying and (2) drawing maps from memory. The drawing of memory maps as an exercise following the first stages of map reading and map copying is intended to give motive for additional map study. Inasmuch as it tests the knowledge of the child in an actual expressive test, the child returns to his study with a definite sense of defect which guides him to the facts he most needs to acquire. The inaccuracy of all memory drawing, if unaccompanied and unchecked by much map study and copying, would of course lead to the fixing of false notions and relations. For this reason, memoriter map reproduction by the pupils has often been vigorously opposed. Its weakness is apparent. Its value lies in its employment as a method of testing knowledge, preliminary to further careful study. H. S.

See GEOGRAPHY, TEACHING OF.

MEN IN EDUCATION. — See TEACHERS, SEX OF.

MEN TEACHERS. — See TEACHERS, SEX OF.

MENÆCHMUS — See CONICS.

MENCIUS, MENGTSE, or MUNGTSE (371–287 B.C.). — Chinese philosopher named Chao Ch'i, or Second Holy One, and called by Martin the St. Paul of Confucianism. He studied under a grandson of Confucius and began to teach at forty. Although he had opportunities of holding important state positions, he preferred to travel and expound Confucianism. He seems to have been more outspoken and fearless than Confucius. The last years of his life he spent in retirement and formulated the philosophical work which is known by his name. Among the most notable of his tenets were the beliefs that human nature is originally good but deteriorates through evil environments; that humanity and righteousness are inherent in man's nature; that government is divine, but is intended for the people's good.

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MENDEL'S LAW or MENDELIANISM. — See HEREDITY; also ATAVISM; CHARACTERISTICS, ACQUIRED.

MENDOTA COLLEGE, MENDOTA CITY, ILL. — A coeducational institution, founded in 1893 and maintaining preparatory, collegiate, theological, commercial, musical, and correspondence courses. Admission requirements are fourteen units. The degrees of A.B., B.S., and D.B. are conferred. The enrollment in the collegiate department in 1910–1911 was only thirteen. The teaching staff consists of eleven members.

MENELAUS. — See GEOMETRY.

MENINGITIS. — The brain and spinal cord are inclosed by three membranes, or meninges, the pia, the arachnoid, and the dura. Meningitis is an inflammation of any one of these membranes, though the arachnoid is not subject to inflammation independently of the other membranes, while inflammation of the dura alone, external meningitis, or pachymeningitis, is only rarely encountered, so that meningitis is practically always an inflammation of the pia, whether of the brain (cerebral meningitis), or of the cord (spinal meningitis), or of both.

Internal meningitis, or leptomeningitis, inflammation of the pia, may take on diverse forms, may arise from diverse causes, and may present diverse symptoms. The two forms of chief interest are tubercular meningitis and epidemic cerebrospinal meningitis.

The cause of tubercular meningitis is the tubercle bacillus, and the affection is probably always secondary to a primary tuberculous process elsewhere in the body. The disease is favored by a tuberculous or scrofulous diathesis, by bad hygienic conditions, and is sometimes a sequel of whooping cough or measles. The premonitory symptoms are headache, listlessness, insomnia, and constipation. The disease then breaks forth with symptoms of fever, vomiting, and a very severe headache, which occasions a peculiar and characteristic scream or cry. On account of the nature of the disturbance in the brain the disease has sometimes been called "basilar meningitis," and formerly "acute hydrocephalus" or "water on the brain." The prognosis is very unfavorable, and death usually occurs within three weeks. Though so fatal when once developed, its appearance may often be warded off, when suspected, by a regimen of wholesome food, warm clothing, and rest.

The several forms of non-tubercular and non-infectious meningitis, or simple acute meningitis, exhibit similar symptoms, without the prodromal stage. They may arise from an extension of other inflammations, *e.g.* otitis, brain abscess, or as complications of pneumonia, typhoid, scarlatina, and other fevers, possibly also from exposure to extreme heat or cold. The onset of the disease is sudden, its course rapid, and its termination usually fatal.

Epidemic cerebrospinal meningitis, also known as cerebrospinal fever, and popularly as "spotted fever," was first recognized early in the nineteenth century, when epidemics appeared in both Europe and America. There have been several severe epidemics since then, notably in Maryland in 1892, at Boston in 1896–1897, at New York City in 1905, and in Scotland and Ireland in 1907–1908. The epidemics are commoner in winter and spring. As to the mode of transmission of the disease we are not entirely clear: it is infectious, but not directly contagious, and appears to follow bad sanitary conditions, especially damp, sunless housing. Its cause is a microörganism, probably the *diplococcus intracellularis* of Weichselbaum, which invades the body through the mouth or nose. Epidemics could be prevented by prompt quarantine, maintained stringently during at least the first two weeks. All discharges from the mouth, nose, and ears should be disinfected. Children or teachers in the same house as the patient should not attend school until the case is terminated. The victims are mostly children and young adults, and the mortality ranges in different epidemics from 25 to 75 per cent, or even higher. According to Osler, the mortality in children under one year is 87.6 per cent. The onset of the disease is sudden, with vomiting, agonizing headache, chills, a rise in temperature, stiffening of the neck, with characteristic retraction of the head, and delirium, followed later by paresis, disturbances of various reflexes, stupor, and remitting fever. Rashes which appear about the fourth day have led to the name "spotted fever." Pneumonia is a frequent accompaniment. Death usually occurs between the fifth and the eighth day. For those who recover, serious sequelæ are to be feared, particularly deafness, blindness, chronic headache, and affections of the joints. This disease has challenged the experts of two continents. The several serums elaborated in Europe proved ineffectual, but experiments at the Rockefeller Medical Institute led to the production of a serum from the immunized horse, which, when applied intraspinally by direct injection, has yielded remarkable results. This Flexner-Jobling serum was first tried on human beings in January, 1907. Up to 1909, tests with about 600 cases showed a reduction of the rate of mortality to about 25 per cent, while now there appears a further prediction that this serum will in the future render this dread disease less than one tenth as dangerous as heretofore. Of peculiar value is the fact that those who recover with the aid of the injections recover completely, there having been but eight instances of physical or mental impairment following 295 recoveries. G. M. W.

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MENSTRUATION. — A periodic activity of the genital organs of the human female, characterized by a discharge from the uterus and Fallopian tubes, the menses, or catamenia. The theory of menstruation most commonly accepted considers this process as the second in a cycle of activities — constructive, destructive, reparative, and quiescent — which runs its course in the uterus and tubes.

The date of appearance of the first menstruation may range from the tenth to even the twenty-fifth year, but the years thirteen to sixteen embrace the large majority of cases, with the fourteenth the most common year, — 13.7 years being a probable average for American girls. There are on record, however, a few extraordinary cases of menstruation in infancy. Cessation of the menses, the menopause, is a similarly variable phenomenon, having been recorded at all ages from thirty to eighty, but commonly falling between the ages of forty-five and fifty-two. Both the establishment and the cessation of this function are gradual and characterized by irregularities.

In general, the irregularities of menstruation may be classed in three types. The flow may be deficient or suppressed (amenorrhea); there may be excess or flooding (metrorrhagia); or there may be undue pain (dysmenorrhea). The first may arise from pathological conditions of the genitals, or from chlorosis, anemia, strong emotion, worry, or bad regimen; the second may arise from local mechanical causes or often from abdominal compression; the third may be congenital, local, or of nervous origin.

This variability of function makes sweeping generalization concerning the relation of school work and menstruation unwise. It is certainly true that some girls, blessed with sound physique and careful home care, can carry on their regular tasks without interruption. It is equally true that girls who suffer from painful periods, or who display pronounced irritability and emotional excitement, must during menstruation be treated as invalids, and be placed under a special regimen, with freedom from worry and from either physical or mental exertion. The publication in 1873 of Clarke's *Sex in Education* occasioned widespread discussion of the need of periodic remission of school work for girls. Despite the criticism of his book, few schoolmen to-day deny the desirability of safeguarding menstruating girls from overpressure, while most physicians have regarded the disabilities attendant on menstruation as sufficient argument against coinstruction or even against coeducation. G. M. W.

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MENTAL ABILITY. — See Ability, General and Special.

MENTAL ADAPTATION. — See Adaptation.

MENTAL ARITHMETIC. — The question as to the merits of the terms "mental arithmetic" and "oral arithmetic" is an old one. It is true that written arithmetic is quite as mental as any other kind, and that the opposite to written is oral. As between the two adjectives there is little choice, however. The words "mental" and "oral" have so long been used interchangeably to apply to that phase of arithmetic that it is not dependent upon written help that they have acquired a rather definite meaning, and seem likely to endure. Historically, the mental long preceded the written, but only in very simple problems, chiefly involving counting and easy addition. As soon as the writing of numbers was introduced, written arithmetic, or else the arithmetic of some form of the abacus, became practically universal. In Japan to-day a native shopkeeper will multiply two by six upon the soroban (see Abacus); and such mechanical aids were not discarded in western Europe until the sixteenth century, and they are still universal in Russia. About the beginning of the last century mental arithmetic underwent a great revival, largely through the influence of Pestalozzi in Europe and Warren Colburn in this country, in each case as a protest against the intellectual sluggishness, lack of reasoning, and slowness of operation of the old written arithmetic. For a long time the oral form was emphasized, in America doubtless unduly so; and this was naturally followed by such a reaction that it lost practically all of its standing. The question is being revived at present as to what are the fair claims of these two phases of the subject upon the time and energy of the pupil and teacher.

There are two points of view in the matter, — the practical and the educational or psychological, — and fortunately they seem to lead to the same conclusion. Practically a person of fair intelligence should not need a pencil and paper to find the cost of six articles at two cents each, or of five and three fourths yards at sixteen cents a yard. The ordinary purchase of household supplies requires a practical ability in the mental arithmetic of daily life, and this ability comes to the mind only through repeated exercise. As will be seen later, it is a fair inference from statistical investigations that a person may be rapid and accurate in written work, but slow and uncertain in oral solutions. Therefore, it will not do, from the practical standpoint, to drill children only in written arithmetic if we expect them to be reasonably proficient in purely mental work. On psychological grounds, too, the neglect of mental arithmetic is unwise. It is a familiar law that the memory is stronger with respect to a fact that is known in several ways (a convenient phrase, if not scientific) than for a fact that is known in only one way. A man who knows a foreign word only through the eye may forget it rather easily; but if his tongue has been taught to pronounce it, even though he be deaf, he can the more readily recall it. If, in addition to this, his ear has often heard it, he is the more strongly fortified, and if he has also often written it, by pen or by typewriter, there is this further chain that holds it to the memory. In other words, the greater the number of stimuli that we can bring to bear, the more certain the reaction. Arithmetic furnishes merely a special case of this general law. If a child could simply see $9 \times 8 = 72$ often enough, he would come to be able to write it in due time, even if he did not know the meaning. If in addition to this he knows the meaning of these symbols and recalls having taken nine bundles of eight sticks each and finding that he had seventy-two sticks, then the impression on the brain is the more lasting. If, furthermore, he has been trained to say " nine times eight are seventy-two " repeatedly, the impression is still stronger; and if he has repeatedly heard this statement (and here is one of the advantages of class recitation), he has a still further mental grip upon the fact. In other words, mental arithmetic in the form of rapid oral work, with both individual and class recitation, is a valuable aid psychologically, to the retention of number facts.

There is, however, a danger to be recognized. A child tires more quickly of abstract work than of genuine concrete problems; problems, that is, that are not manifestly " made up," but that represent some of his actual quantitative experiences. It therefore follows that if five minutes of mental work produce a certain efficiency, thirty minutes will not produce six times that efficiency. If this mental work is valuable, how much time and energy should be allotted to it? It seems to be the experience of teachers generally that a little mental work, rapid, spirited, perhaps with some healthy, generous rivalry to add spice to the exercise, should form part of every recitation throughout the course in arithmetic. There will often be exceptions, but in general it is a pretty good rule to devote from three to five minutes daily, and sometimes much more time, to this kind of work. In this way a child never gets out of practice, save during the summer holidays, and the practical and psychological benefits can hardly be overestimated.

On the applied side there is no better test for the teacher's ability to adapt herself to her environment, educationally, than this; for the nature of the mental work varies with the school year, the locality, the related subjects in the course, and with many other factors. In general, however, it may be said that mental arithmetic offers the best means for correlating the subject with the pupil's other work, both within and without the school. To limit it to this field, however, would be an evident mistake, the work with abstract number demanding the major part of the time assigned to this feature. To acquire perfect mechanical reaction to a given stimulus much exercise is required, and for a child to think seventy-two when stimulated by the ideas 9×8 and 8×9 demands repeated practice, not merely in relatively few applications, but in a multitude of questions involving abstract numbers. Nor is this practice any more irksome than is the solution of the ordinary applied problems of the textbook, as any teacher knows. It was almost exclusively by this abstract work that Pestalozzi developed calculators of such ability with concrete problems as astonished those who visited his school.

There are two lines of work in mental arithmetic: (1) the concrete, in which the teacher has an excellent opportunity for correlation, for local color, and for stimulating the interest in the uses of arithmetic; (2) the abstract, in which the textbook may be trusted to furnish a considerable part of the material. Each must be cultivated, and ability in one does not necessarily mean a corresponding standard of ability in the other, although a failure in the abstract line must lead to a failure in the concrete. One leads to the acquisition of number facts, the other to the ability to rationally use these facts in applied problems. D. E. S.

See Arithmetic; Problems.

MENTAL DEFECTS. — See Mind, Diseases of.

MENTAL DEVELOPMENT. — Strictly speaking, this term covers those changes in individual consciousness which occur in the course of experience. Infancy (*q.v.*) shows very little mental power beyond the few instinctive tendencies (see Instinct) which are inherited and the emotions (*q.v.*) which grow out of the instincts. From this point on (see Child Psychology and Psychology, Genetic) characteristic changes appear in habit (*q.v.*), perception (*q.v.*), and all the other mental processes.

Wundt has summarized the principles of mental development in three general laws. The first law is that of mental growth, and sets forth the fact that in the course of development the individual creates new forms of experience. The second law sets forth the fact that the end of mental processes is continually progressing with the growth of experience. The third law states that there is a tendency for the mind to oscillate in its development between extremes.

The full discussion of the facts and principles of mental development involves all of the problems of education. C. H. J.

See Psychology, Genetic; also Adolescence and the various topics on Psychology as given in the topical outline.

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MENTAL DIFFERENCES. — See Individual Differences; Tests, Mental; also Ability, General and Special.

MENTAL DISCIPLINE. — See Formal Discipline.

MENTAL DISEASES. — See Mind, Diseases of; Psychiatry.

MENTAL GROWTH. — See Growth.

MENTAL HYGIENE. — See Hygiene, School.

MENTAL IMAGERY. — See Imagery.

MENTAL MEASUREMENT. — It is usual, in experimental psychology, to distinguish between *direct* and *indirect* mental measurement.

Direct Mental Measurement. — To make a measurement is, in strictness, to compare a given magnitude with a conventional unit of the same kind, and to determine how many times the unit is contained in the magnitude; the numerical result is the measure of the magnitude in question. The prototype of measurement, in all departments of natural science, is thus linear measurement in space. Here we have as datum a certain finite magnitude, a given length or distance; we have our conventional unit, mile or meter; and the homogeneity of space assures us that the given magnitude and the unit of measurement are of precisely the same kind. The procedure of measurement consists in the laying off of unit distances 0 — 1, over and over again, upon the given distance, 0 — *x*, until the limiting point *x* is reached. To say, *e.g.*, that a mountain is 5000 feet high means that the unit of one foot may be laid off, 5000 times over, upon the vertical line extending from sea level to the summit of the mountain.

There can be no doubt that measurement of this elementary and direct kind is possible in psychology. Indeed, the history of astronomy furnishes an excellent instance of mental measurement that antedates by nearly two thousand years the establishment of the first psychological laboratory. The Greek astronomer Hipparchus (*c.* 130 B.C.), and after him the Alexandrian Ptolemy (*c.* 150 A.D.), classified over one thousand of the fixed stars in terms of their luster or brightness. The brightest stars form class 1; those just visible to the naked eye form class 6; the stars of intermediate luster are grouped in the intermediate classes 2, 3, 4, 5. And these six classes are sensibly equidistant; so that the interval of luster, the difference of brightness, between stars of classes 1 and 2 is equal for sensation to the interval or distance between stars of classes 3 and 4, or 5 and 6. In other words: the ancient astronomers had before them a certain mental magnitude, the range of luster from bright to dim, from the brightest star in their sky to the star that could but just be made out against its background; and they measured this range or distance by dividing it into five equal unit distances. The given magnitude 0 — *x* is changed, by measurement, into the series 6 — 1; it contains the unit of measurement, the conventional class difference or class interval, five times over. The arrangement into six classes was dictated, we may suppose, by superstitious reasons; the arrangement itself is an essay in mental measurement.

So far, however, we have no means of giving an objective expression to these estimates of mental interval; for that we must await the advent of stellar photometry. Physical measurements of the luminosity of the fixed stars show that the light intensities of the six classes form, in ascending order, a rough approximation to a geometrical series, with an exponent of 2.5. This result tells us two things: first that the mental measurement was fairly accurate; the unit of brightness-difference, though not exact, is approximately the same at all parts of the five-unit scale; and secondly, that brightness-differences which are absolutely equal in sensation correspond to differences of physical light intensity that are themselves not absolutely but relatively equal. (See WEBER'S LAW.) These points may be further illustrated by reference to experiments made by Ebbinghaus in 1887; the problem was to pick out a series of eight equidistant brightnesses from a set of fifty papers that had been washed over with various amounts of Indian ink; and the quotients of the successive pairs of (photometrically measured) stimulus values were:—

2.3, 2.1, 2.1, 1.8, 1.7, 1.7, 2.0.

Here, again, is an approximate constancy of physical result, a constancy as great as could be expected from the limited material of observation; and here, too, is confirmation of the validity of a mental measurement.

It is clear from these examples that a direct mental measurement is possible in all cases in which the subject matter of psychology takes the form of a homogeneous continuum. This state of affairs is realized, certainly, for various departments and for sundry attributes of sensation; for the intensity, and perhaps for the quality of simple feeling; and, probably, for degree of attention. No more can, at present, be said. Simple as the principle of mental measurement is, the actual measuring is exceedingly difficult: the investigator must, first, set up a workable and as it were objective unit of measurement, and must then follow a rigorous method and eliminate many sources of error in his attempt to lay off this unit upon the magnitude to be measured; the whole object of measurement is, after all, to carry accuracy into spheres of scientific research in which unaided observation, bare estimation, is inaccurate. So far, therefore, direct mental measurements, despite their importance for the theory and system of psychology, have been made only in a comparatively narrow field.

A question which the author has often been asked, and which it may be worth while to answer here, is this: What is the difference between, say, the Ptolemaic classification of the stars and the sorting into groups of a number of examination papers in history, on the basis of equal differences in percentage of "marks"? The difference is that the classification of stars rests on sensed equality of brightness interval; whereas the grouping by marks assumes that the writer of a paper marked ninety excels in ability the writer of a paper marked eighty just precisely in the same degree that the writer who is marked sixty excels the writer marked fifty. There is evidently no warrant for this assumption; the marks could be used as indexes of mental measurement only if we had already established, by some other means, an unit difference of ability in history. It may be added that, so far as we can now see, the establishment of such an unit must be a matter of indirect, not of direct, mental measurement.

Indirect Mental Measurement.—The great majority of the numerical results found in textbooks of experimental psychology represent what is called "indirect" mental measurement. They are numerical expressions for the physical antecedents or consequents of consciousness; that is to say, for stimuli or organic movements; they state the physical intensity of a light or sound, the length or direction of a line in objective space, the force or extent of a voluntary movement, the objective duration of a mental event, the number of stimuli simultaneously presented to an observer, and so forth. They fall under our present heading because their interest and relevance are always and wholly psychological; they are determined for psychological reasons, and have no value beyond psychology. In many cases they are necessary to the completeness of a direct measurement. Thus, we have seen that a certain range of luster or brightness, that of the fixed stars visible to the naked eye, has been divided by astronomers into five equal intervals or distances. If, however, we wish to measure directly the whole extent of sensible brightness, from its absolute minimum to its absolute maximum, we must find out, under the most favorable experimental conditions, what duller and what brighter lusters can still be distinguished; we must determine, photometrically, the light values of the liminal and terminal brightnesses, the end points of our sensible scale; and we must then apply our chosen unit of measurement over the entire range. The fixation, in terms of stimulus, of the extreme points or positions of the sensory scale is a necessary preliminary to a complete direct measurement.

The scope and value of indirect measurement can, perhaps, be shown best by illustration; there is, in fact, no department of psychology that has not benefited by it. Thus, in the field of visual sensation, it is important to obtain color matches or color equations both for color-blind and normal eyes, and also for the normal eye at various stages of adaptation: these equations are recorded in terms of photometric intensity and wave length. The influence of visual contrast may be measured as follows: a stimulus *a*, which shows the effect of contrast, is equal to a stimulus *b*, which is exempt from contrast; *a* is then removed from its surroundings, and the difference between the free *b* and the free *a*, expressed in physical terms, measures the change which *a* suffered under the conditions in which contrast was operative. The same principle is employed in the measurement of optical illusion, that is, of the apparent change in the direction or extent of lines that form part of certain geometrical figures; a perfect square, for instance, seems to be higher than it is broad. The degree of blending of simultaneous tones is measured by the percentage of cases in which the auditory perception fails of analysis, *i.e.* in which two tonal stimuli are apprehended as a single tone. The temporal limits of the perception of rhythm, *i.e.* the slowest and fastest rates at which rhythm is perceived, and the limit of complexity of the rhythmical unit, may all be established by reference to the rate and number of the recurrent stimuli. The range of attention is measured by the number of separate stimuli whose perceptions are clear and focal in consciousness at one and the same time; the duration of attention by the length of time during which a perception can maintain its focal position. A great deal of quantitative work has been done upon the function of memory: thus, the number of readings of a given material, necessary under various conditions for faultless recitation, indicates the most economical method of memorizing; the number of new readings required for recitation, after different intervals of time, gives an inverse measure of the decay of memory; and variations in the nature of the material itself, in the emphasis which different parts of it receive, in the rate of its assimilation, in the amount presented at a single sitting, in the temporal distribution of these sittings, — variations of this kind yield each one its own numerical results, which further our understanding and control of memory at large. The reaction experiment (*q.v.*), in which we measure the time elapsing between the exhibition of a stimulus and the performance of a responsive movement, serves a number of psychological purposes; in the simple reaction, variation of the modality, the quality, the intensity of the stimulus brings about characteristic differences in the length of the reaction time; and in the more complex forms of the experiment we obtain a temporal measure of discrimination, association, choice, even of the act of thought itself. Indeed, in this sense of indirect measurement there is no type of psychological experiment that may not be given a quantitative form: the growth and tenacity of habit, the onset, course, and degree of mental fatigue, the acuity of sense perception, the degree and constancy of emotive arousal, the laws of retention, association, and reproduction, the delicacy and regularity of voluntary movements, these and a hundred other things of like character may now be expressed in numerical terms. And it is plain that indirect measurement, while it has not the theoretical importance that attaches to a direct measurement of mind, is yet of very great practical importance. Studies of the speed and extent of eye movement, coupled with studies of relative legibility as dependent on letter form, spacing, etc., not only give us a psychology of reading, but also suggest rules for the make-up of our books and newspapers; the study of the movements of writing leads to similar practical results; the precepts of school hygiene are largely based upon norms furnished by psychological experiment; and the exact psychological study of attention, retention, and association supplies us with tests of the drawing power of an advertisement, of a man's special aptitude for some form of skilled labor, of the reliability of a witness, even of the criminality of an accused person. It is true that these tests cannot be applied indiscriminately; it is true, also, that many, perhaps most, of them have not yet been perfected; applications of psychology are still in their infancy. Nevertheless, the widespread interest now taken in questions of practical application proves that experimental psychology has done well to multiply and refine its methods of indirect measurement.

In conclusion, mention must be made of the measurement of correlation, a line of work which dates from the beginning of the present century, and which has steadily gained in favor. Correlation may be defined as a tendency toward concomitant variation on the part of two or more mental traits or mental abilities within a group of individuals. Provided that the group is well defined and its environment uniform, the result of a measurement of this tendency may be transferred from the group to the individual, and may then be regarded as measuring the closeness of connection of the traits or abilities in the particular case. An observed correspondence may be due either to an actual interrelation of the characters under investigation, or to the influence of the common environment. Both cases are of psychological import, as throwing light on the constitution of mind, on the relative influence of heredity and education, on the Mendelian doctrine of the unit character, etc.; and both have an evident bearing upon educational problems. E. B. T.

See PSYCHOPHYSICS; REACTION EXPERIMENTS; STATISTICAL METHODS; TESTS, PSYCHOPHYSICAL.

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MENTAL PATHOLOGY. — See PSYCHOLOGY, PATHOLOGICAL.

MENTAL PHILOSOPHY. — See PSYCHOLOGY.

MENTAL TESTS. — See MENTAL MEASUREMENT; TESTS; TESTS, PSYCHOPHYSICAL.

MENTAL TRAINING. — See FORMAL DISCIPLINE.

MENTALLY DEFICIENT. — See BACKWARD PUPILS; DEFECTIVES; DEFECTIVES, SCHOOLS FOR; EXCEPTIONAL CHILDREN; GRADING AND PROMOTION; RETARDATION AND ELIMINATION; SPECIAL CLASSES.

MERCER UNIVERSITY, MACON, GA. — Established in 1829 as a classical and theological school for prospective ministers only, combining agricultural labor with study. In 1832 other students were admitted. The university charter was obtained in 1837. Until 1871 work was carried on at Penfield, Ga. The following schools are maintained: arts, law, pharmacy, and summer. The entrance requirements are fourteen units. The degrees of A.B., A.M., LL.B. (on a two years' course), Bachelor of Pharmacy (two years), and Master of Pharmacy (Ph.B., and Ph.M.) are conferred. The enrollment in 1910–1911 was 368. The faculty consists of thirty-one members.

MERCHANT TAYLORS' SCHOOL, LONDON, ENGLAND. — One of the nine Public Schools of England. It was founded in 1560–1561 by the Merchant Taylors Company of London " for the better education and bringing up of children in good manners and literature." The school was located in the parish of St. Lawrence Poulteney. The statutes were framed on the model of those of St. Paul's School. The number of scholars was limited to 250, and there were to be appointed a high master, chief usher, and assistant usher. Richard Mulcaster (*q.v.*) was the first headmaster, and the school, when opened in September, 1561, at once sprang into popular favor. Unlike most other public schools, Merchant Taylors' School was and has always remained a day school. Through the munificence of Sir Thomas White, a member of the Court of the Company, thirty-seven fellowships at St. John's College, Oxford, founded by himself in 1557, were established for Merchant Taylor scholars, thus linking the school with a college in the same way as Eton and Winchester had their respective affiliations at Cambridge and Oxford. The school under Mulcaster was highly successful; one of the most illustrious of the alumni was Edmund Spenser; in addition to the general classical and religious curriculum, he encouraged music and acting, and companies of the boys performed plays and masques before the Queen (1573, 1575, and 1583). With this feature of school life Merchant Taylors' was long associated, particularly in the eighteenth century. The salary of the headmaster, however, was and for long continued to be so small and the restriction on numbers so rigidly adhered to that Mulcaster resigned in 1586. With the development of the school may be traced the rise of the examination system in England, the first visitation of the diocesan being made in 1562 (see EXAMINATIONS). During the Civil War the school appears to have been royalist, and many of the alumni, risen in not a few cases from " poor scholars " to bishoprics, were strong defenders of the Anglican Church. The Great Fire of 1666 practically destroyed the school, but fortunately the library, which was maintained by gifts of books from the members of the Company, was saved. A new building was erected in 1675. The curriculum of the school continued to be classical until the beginning of the nineteenth century. In 1828 mathematics began to be taught regularly; in 1845 French was introduced as an extra and as a regular subject in the following year; modern history was added in the same year (1846), and in 1856 drawing appeared. The school has always encouraged the study of Hebrew, and is one of the few places where it is still retained. In 1861 an opportunity of moving to more spacious quarters was afforded by the purchase of the Charterhouse buildings. The change was not effected until 1875, and the increased accommodation permitted a doubling of the numbers. The school is divided into classical, modern, and special (mathematical and science) sides, and facilities are offered for the study of chemistry, physics, and biology, so that pupils taking these subjects may shorten the normal medical course by six months. The school is mainly a day school, boarders being received only by special arrangement. The number of boys in the school is 500.

See GRAMMAR SCHOOL; PUBLIC SCHOOLS; ENGLAND, EDUCATION IN; GILDS AND EDUCATION.

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MEREDITH, GEORGE (1828–1909). — The English novelist was born in Hampshire, England, and up to fifteen years of age was at school at Neuwied in Germany. He began, but soon abandoned, law, and took to journalism, and in 1866 acted as correspondent to the *Morning Post* during the war between Italy and Austria. In 1867 he acted in place of John Morley as editor of the *Fortnightly Review*, and became literary adviser to Messrs. Chapman and Hall. Meredith published *Poems* in 1851, and throughout his life continued to write poetry which placed him in the first rank; but it is in his novels that he presents the most strongly marked relations to the interests of theoretical and practical education. In 1856 *The Shaving of Shagpat* appeared, cast in the form of an Oriental allegory. The story traces the educative power of circumstances and the disciplinary effect of the world's " thwacks." In 1859 Meredith published *The Ordeal of Richard Feverel*, in which he insists that the parent as educator must arouse and help the directions of activity of the child's own mind, must encourage the development of the child's independent individuality; and this he urges as graphically as any specialist educator. Instead of writing a disquisition, like Rousseau, to show the virtue of judiciously leaving the boy alone, Meredith traces dramatically the consequence of interfering with a soul, even by a father with his son's. The work becomes the scene of a great educational experiment, from which springs up the conviction of the necessity of freedom from system and spontaneity of development in all true education. In *Evan Harrington* (1860) and *Rhoda Fleming* (1865) are further studies of boy and girl training respectively, and in the *Egoist* (1879) is developed the tragedy of the attempt to dominate the personality of the lover, as Sir Austin Feverel had attempted in the case of his son. In 1894 came *Lord Ormont and his Aminta*, which may be called Meredith's schoolmasters' novel, in which he places Matthew Weyburn's ideal school, under the joint direction of himself and his wife, by the side of a Swiss lake, where swimming and physical exercises of the Swiss mountains and valleys are as natural as meals. Boys of all nationalities are welcomed, and cosmopolitanism becomes at once an aim and a method of education. Coeducation of the sexes receives the impress of the natural environment of Switzerland, and education appears as the entry into a large-hearted, large-minded, healthy, vigorous life, with infinite riches of various personalities. F. W.

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MERIT SYSTEM. — See PUBLIC SERVICE, TRAINING FOR.

MERTON, WALTER DE (d. 1277). — English divine and statesman, at one time chancellor under Henry III, and Bishop of Rochester. Educationally Merton is of note as the founder of the first college at Oxford, which became the model for all future colleges at Oxford and Cambridge. In 1264 he formally assigned two manors, at Farleigh and Maldon in Surrey, to be held for the establishment of a "House of the Scholars of Merton at Maldon" with power to maintain twenty scholars at "Oxford or elsewhere where a university may happen to flourish." In 1270 Merton College was definitely and permanently moved to Oxford, and new statutes were issued in 1274 by the founder, who also provided, if necessary, for the primary education in rudiments of orphans of his kin up to the number of thirteen.

See OXFORD, UNIVERSITY OF; COLLEGE; UNIVERSITIES; FAGGING.

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MESMERISM. — A theory propounded by Mesmer (1734-1815), the practices which he popularized, and the interpretation of the phenomena presented. The name given by Mesmer to his doctrine was "Animal Magnetism." He assumed the existence of a "universally diffused subtle fluid, . . . affecting the animal economy by insinuating itself into the nerves." It has properties like the magnet, may be transmitted, and "will cure nervous diseases directly and others indirectly by provoking salutary crises, thus bringing the art of healing to perfection." The theory was presented dogmatically, and fantastically affected his practice. He began by applying a magnet to the affected part, then in Paris (1778-1784) constructed the "baquet," or tub, filled with iron filings and other paraphernalia suggestive of some magnetic force, about which sat the patients, drawing from it and from Mesmer's passings and strokings the curative "force"; but in the end he announced that the "magnetism" was concentrated in his own person, and that he could impart its virtues to a glass of water or other inert substance. It is to this form of the theory, as a force emanating from peculiarly endowed individuals, that the term "Mesmerism" came to be attached.

Mesmer's practice was affected by the medical theory that diseases must run their course and reach a crisis; the manipulations and the "magnetic force" precipitated the crises, which, as they receded, left the patient cured. These crises, frequently taking the form of an hysterical attack, were the common symptoms at the exciting scenes enacted in the *salle des crises;* yet the accounts show that the strokings and passes and suggestions — not unlike the "touch" for the king's evil and the methods of exorcism and faith healing — drove away pains, paralyses, and invalid impediments. Mesmer doubtless induced alterations of consciousness and hypnotic suggestibility, but quite ignored their significance. It was the Marquis de Puységur, a disciple of Mesmer, who, in 1784, called attention to the altered psychological state of the subject; to the fact that the subject was responsive only to the verbal suggestion of the operator and recalled nothing of his experiences when awake. To this altered condition he gave the name of "artificial somnambulism," correctly recognizing its analogy to the sleep-walking state. Puységur discarded the "mesmeric" theory, and became the first hypnotist. It remained for James Braid in 1843 to demonstrate the physiological reality of the condition as an altered disposition of the nervous system depending upon some peculiar susceptibility of the subject; to this condition he gave the name of *hypnosis*. The rôle of suggestion was recognized, and made possible the scientific study of abnormal psychophysiological consciousness and control — or, more exactly, the revival of it — in the latter decades of the nineteenth century. (See HYPNOSIS.)

Viewed historically, "mesmerism" becomes an antecedent of hypnotism; and the vicissitudes of its career form a complicated story, in which false and misleading views growing out of mysticism, of faulty observation, or of leaning toward occult or supernormal beliefs obscure issues and thwart profitable insight. Mesmer's obstinate controversies with investigating commissions, the one referring the observed phenomena to the action of a "fluid," and the other to imagination; Puységur's *somnambules*, quickly degenerating to second-sight diagnosticians and readers of sealed messages; Braid's entanglements with phrenology, — these and other phases left their impress alike upon the prejudices and the legitimate demands of the medical profession, and made the transition from "mesmerism" to "hypnotism" a difficult and circuitous process. The convincing data were, in the early stages, the anæsthetic state, permitting serious surgical operations to proceed without pain; and in the later stages, the orderly interpretation of psychological phenomena under the leadership of men like Charcot, of established scientific reputation. With the establishment of the genuineness of the hypnotic state and of its interpretation as due to the nervous susceptibility of the subject, the scientific attitude was secure; and the notions attached to "mesmerism" as an objective "force" were wholly relegated to an historical significance alone.

J. J.

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Most of the handbooks on *Hypnotism* give an account of Mesmer and his practices.

MESSER, ASA (1769–1836). — Third president of Brown University. Graduating from Brown in 1790, he was tutor and professor there from 1791 to 1802, and president of the institution from 1802 to 1826. W. S. M.

MESSINA, UNIVERSITY OF. — See ITALY, EDUCATION IN.

METAL WORK IN THE SCHOOLS. — See MANUAL TRAINING.

METALLURGY. — See TECHNICAL EDUCATION.

METAPHYSICS. — The name "metaphysics" as designating philosophy or some one of its branches arose from a misunderstanding of an accidental way of describing certain writings of Aristotle; namely, those coming after the physics. This was shortly taken to mean the things that lie beyond the physical, that are above the natural — a conception which medieval thought identified with the supernatural. This long remained the popular signification, so that Shakespeare, for example, refers to ghosts as metaphysical.

Aristotle himself in the body of his treatise supplied some grounds for identifying his discussions with theology. His formal designation is first philosophy, and this he says has for its object a descriptive definition of being as being, or existence as existence. Each branch of science considers the traits of some set or class of existences; but no science considers the traits that all existences alike possess. Hence they leave room for and indeed require a more general and formal science to take up the matter they leave untouched. So far there is no ground for referring first philosophy, or metaphysics, to anything transcending the subject matter of the sciences. But in the course of his discussions, Aristotle is led to discriminate grades of being and to conclude that only pure actuality, or God, is completely real, or can be said to *Be* without qualification. Hence metaphysics appears as a science of the highest and more real mode of Being.

Throughout the eighteenth and earlier nineteenth centuries "metaphysics" was loosely used to denote inquiries concerned with mind, what would now generally be called psychology; and also to denote any inquiry of an ultimate sort. In the later sense it was generally divided into ontology, or inquiry into Being, and epistemology, or inquiry into the nature and limits of knowing. At present, there is a tendency to revert to the more limited Aristotelian sense, though the term is still widely used as a generic name to cover all sorts of inquiries that do not seem to fall within the scope of any of the positive or mathematical sciences. J. D.

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METEOROLOGY. — The scientific study of the phenomena of the atmosphere. See GEOGRAPHY; GEOLOGY.

METHOD. — The topic of method represents one of the three typical phases of educational practice, the subject matter of study and the institutional agencies of education being the other two. As in the case of subject matter (see COURSE OF STUDY, THEORY OF), there are important practical matters at issue and also general philosophical considerations. The former is the field of methods (in the plural number), the ways of teaching special subjects in accordance with principles that successful experience has vindicated — often called "Special Methods." The latter centers about the problem of the relation of mental attitude and operation to subject matter. For reasons that will appear in the sequel, this problem passes into that of the relation of the individual self to the objects of the world and social life. Intermediate between the field of specific practices and the one of general theory is the logical question of an underlying uniformity of method in the application of mind to various subjects whether pure mathematics, the natural sciences, or history, literature, and language. This intermediate question usually goes by the name of "general method." The present article is confined to the distinctively philosophic aspect of method, extending the survey, however, to take in those phases of general method that are closely connected.

In a general way method is the obverse and correlative of subject matter. The proper interpretation of the connection and distinction between the two is, however, by no means evident, especially since it has been complicated and to some extent perverted by the pervasive influence of a dualistic philosophy. (See DUALISM.) Mind has been severed from the world; the individual from society and its growth. The two have not only been divorced, but the separation between them has been intensified to the point of complete antithesis. (See HUMANISM AND NATURALISM; and IDEALISM.) All effective knowing and acting involve, moreover, both the mind in the world and individual agency in social conditions and for social aims. Hence, the more the separation is emphasized, the more urgent becomes the question of the possibility of interaction and reciprocal influence. While the distinction of subject matter and method was never sharpened into such extreme opposition as that just indicated, the dualistic antithesis of mind and the world affected men's ideas of these educational subjects. The problem of method was conceived as the problem of the adaptation of an individual mind to a foreign subject matter; as an affair of bringing together two things that naturally and intrinsically have nothing to do with each other. This background influenced the conceptions of discipline, culture, and interest (*qq.v.*). Even where the extreme dualism of mind and the world, self and social institutions, has been professedly surrendered, it is not uncommon to see questions of method of teaching, study, and moral training discussed as if they were essentially matters of adaptation of one thing to another unlike thing. How may the study in question be presented *to* the mind so as to appeal to it? How may the mind be aroused so as to apply itself *to* this topic, naturally alien? Such ways of conceiving, in the concrete, the relations of subject matter and method indicate the intellectual atmosphere in which the discussion of mental operation and application has been bathed.

An analysis of experience shows, however, that experience is not a combination of subject matter and method, or an interaction of two independent factors, one of which supplies content and the other form. The distinction between these two matters is developed within experience itself, and arises for the sake of greater control of the course of experience. As indicated in the article on experience (*q.v.*), experience has a dynamic and a static aspect, one of transition and one of cumulation, of retention. Experience, that is, is always changing, and yet it is not a mere flux. There is always a somewhat that changes, and its transition is not a mere passing away, but is a transformation. Here we have the root of the distinction between content and form, subject matter and method, object and subject. It centers in the distinction of the *what* and the *how* of experience. *What* we experience varies in quality, in value, significance. The transition from one state to another is, therefore, measured by the content it ushers in, while the presence and appreciation of this or that object depends upon the factor of transition. In order to secure the objects that are of positive or greater value and to avoid the objects that are of negative or lesser value, we must control the processes of change by which one content of experience gives way to another and grows into it. Whatever in experience, accordingly, aids in control of its development so as to attain what is desired and exclude what is not wanted, is method, way, form of experience. The objects and subject matters that are influenced by this control constitute the material, the structure of experience.

In the course of an infant's restless activity, light is felt and enjoyed. The light, however, is more or less submerged in the qualities that attend the moving of the head, the arms and hands, and certain intraorganic processes. It is, therefore, a vague and confused object, lacking distinctness. In subsequent experience, it is found by accident (that is, without deliberate effort or conscious intention) that the enjoyment of the light quality — such as it is — coheres with changes of the head, eyes, and position of the body, these qualities not having the value attaching to them that the light quality has. As soon as this connection is apparent, the light acquires the status of an *object*, of material or content; while the qualities of the movements of organs of the body in losing their primary values are reduced to the status of means or agencies for getting the object. Thus occurs the gradual differentiation of object and subject, matter and method. The subject matter does not, however, always present itself as an end to be secured; movement in the desired direction may be impeded by certain contents. These resisting factors then stand out conspicuously as obstacles, hindrances. They also become objects, part of the subject matter of experience, for it depends upon the way they are worked upon whether the desired end is ushered in or not. It should be noted that the distinction between matter and method, material and way of treating it, is not a rigid one. What is subject matter at one time may be a part of method at another, and *vice versa*, according as it functions in a concrete situation. In concrete experience it may happen that the sound quality is the significantly desirable thing and that the light or color quality is of import only as clew or stimulus to the presence of the sound as end. Then the seeing reduces itself to the status of means, agency, method. It falls on the side of the subject, no longer on that of the object.

Two things then characterize the concept of method. Methods with respect to their origin mark the gradual differentiation of certain elements of experience; and, with respect to their function, represent any attitudes and operations that are employed to give the course or sequence of experience a direction that is desirable. Method at bottom is but the way of doing things followed in any given case. Its psychological counterpart is the habits and habitual attitudes that determine the course of experience. It follows that methods are at first formed by a semi-instinctive process of trial, error, and success, and that they operate very largely unconsciously. That is to say, attention is given primarily to the ends and obstacles involved, and the habits respond more or less spontaneously to the idea and perception of these objects.

At this point a serious error is often made in the conception of educational method. Just because these primary ways of doing things which represent method at its primary and deepest level have been formed in relatively accidental fashion and also prior to the period of conscious school instruction; because, moreover, they often mark relatively ineffective and blundering ways of accomplishing ends, there is a tendency to ignore them or to deny that they are methods at all. Method is then conceived as a purely logical matter, in a sense that identifies the logical with a consciously formed and followed enterprise. Such methods are embodied in symbols, and need not be embodied in working attitudes and habits at all. They are formulæ for ways in which things consciously ought to be done, not descriptions of the ways in which they *actually* are done. Thus a complete split is introduced between what are called psychological methods (but which might better be termed vital, concrete, or practical methods) and the so-called logical methods — which might better be termed formal and symbolic. The result is that new habits which are largely verbal are grafted on to the older working habits — generally to the detriment of their efficacy; or else, in reaction from the futility of mere formulations of logical abstractions, the spontaneous, habitual attitudes are relied upon, without securing the readjustment and reconstruction needed for higher and more complex ends — for securing a better type of control.

The fundamental question of method in education thus concerns the right coöperation of the unconscious and the reflective factors in the direction of the course of experience. Method, the way of going at a thing, depends at first upon the relation between instinct and desire, on one side, and an end, on the other. The end stands out more or less in consciousness and supplies the basis of conscious guidance. What is educationally important is, therefore, that on one side the proper type of desire be aroused and the proper type of end be conceived on the other. These points are not matters of conscious formulation, but of providing environing conditions that will call out and fix desirable attitudes of response. Only as these attitudes become sufficiently habitual to be effective is there any basis for conscious reflection so as to formulate methods for further conscious employment. When, as is too frequently the case in such subjects as arithmetic and grammar, teachers insist that pupils shall consciously follow certain forms of statement and "analysis" before they have become thoroughly habituated to dealing practically with the situations in which numerical and grammatical values occur, the result is that the formulæ come between the pupils and their appreciation of the nature of the situation. They do not respond any longer to the results of the experienced situation, but only to the verbally acquired formulæ. The very means that are supposed to render the pupils' operations more intelligent, more logical, result in making them mechanical.

Logical method, in short, as a conscious procedure always implies reflection upon the means which have already been instinctively and hence unconsciously used in reaching ends that make an appeal on their own account. Formulated logical operations are thus the possession of an expert in a subject, one who has already worked through the subject, and who has, therefore, command of the materials to be formulated. They represent the standpoint of a matured, a developed, experience. The commonest school fallacy is that the methods which represent the control of a subject matter gained through long practical experience can be conveyed directly to those who are just beginning to occupy themselves with a topic, so that the procedure of the latter may be made more reasonable and intelligent. Many methods that are condemned as "deductive" are really not deductive at all, but simply represent the attempt to hand over directly to the inexperienced and immature the intellectual technique appropriate to those who have gone through a subject, and who are therefore in a condition to review and systematize the procedures that have proved effective.

The currency of the wrong conception of logical method leads to a reaction almost equally harmful. Considerations of order, sequence, definiteness, of fit adaptation of means to ends, the importance of thoughtful surveys and reviews of ground traversed, together with the need of formulating the practices that have been found helpful, are ignored. Behavior is left on the instinctive or "spontaneous" plane with no care to see that the attitudes that are evoked are those most adequate to their direct end, and also such as to stimulate later reflection. The true difference is not between the merely psychological—the illogical—but between the unconscious logic of effective adaptation to ends and the conscious logic of formulating the methods that have been successfully employed, so that subsequent procedure may be easier and more fruitful. And this transition, through reflection upon that which has been already accomplished, from the blinder and more instinctive into the more intelligently controlled, should be a constant factor of all growth; it is, indeed, indispensable, if growth is to be truly educative. (See Education.)

From this conception of method there follow certain considerations applicable to the topic of general method. Strictly speaking, method is thoroughly individual. Each person has his own instinctive way of going at a thing; the attitude and the mode of approach and attack are individual. To ignore this individuality of approach, to try to substitute for it, under the name of "general method," a uniform scheme of procedure, is simply to cripple the only effective agencies of operation, and to overlay them with a mechanical formalism that produces only a routine conventionality of mental quality. Certain features may be found, however, which are involved in the transition from unconscious effort to a more consciously guided process. These features may be abstracted and generalized. While the outcome will not put individuals in possession of a sure key to intellectual efficiency, it will indicate to a teacher the main steps that have to be taken, and suggest the crucial points where conditions of growth have to be carefully maintained and fostered.

The primary factor in general method, so construed, is the existence of a situation which appeals to an individual as his own concern or interest, that is to say, as presenting an end to be achieved, because arousing desire and effort. The second point is that the conditions be such as to stimulate observation and memory in locating the means, the obstacles and resources that must be reckoned with in dealing with the situation. The third point is the formation of a plan of procedure, a theory or hypothesis about the best way of proceeding. The fourth is putting the plan into operation. The fifth and last is the comparison of the result reached with what was intended, and a consequent estimate of the worth of the method followed, a more critical discernment of its weak and its strong points. These five steps may be reduced to three more generic ones. The first and fundamental condition of right method is the existence of some concrete situation involving an end that interests the individual, and that requires active and thoughtful effort in order to be reached. The second is consideration of the nature of the problem, the difficulty or perplexity involved in reaching the end set, so as to form a suggestion or conjecture as to the best way of proceeding to solve the difficulty. The third is the overt effort in which the thought of the plan is applied and thereby tested. Scientific method will be found to involve exactly the same steps, save that a scientific mode of approach implies a large body of prior empirical and tentative procedures which have finally been sifted so as to develop a technique consciously formulated and adapted to the given type of problem.

J. D.

See Science.

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METHOD READERS. — In teaching beginners to read two methods are employed. One group of teachers makes no systematic attempt to deal with phonetic and spelling difficulties, but emphasizes the thought. Their units of treatment are the word, phrase, and sentence. The materials used are therefore selected from the child's spontaneous usage, children's classics (such as Mother Goose), and the best suitable English literature. Artificial content and form are omitted from the beginning. Another group of instructors contend that the main function in teaching beginners to read is to give them a mastery of the mechanics of pronunciation and spelling. Hence these emphasize the phonetic difficulties in translating visual symbols into sound. They stress units smaller than the word — the letter, diphthong, syllable, and phonogram. Their reading material is consequently selected with reference to the systematic control and graded presentation of phonetic elements. The primers and readers used by them have a systematic plan or method, hence such reading books are called "method readers" to distinguish them from the so-called "thought readers," which emphasize interesting content rather than phonic elements. H. S.

See Reading, Teaching of.

METHOD WHOLE. — So much of the subject matter of any school subject as is sufficiently related to be treated as a teaching unit. A method unit or whole is usually treated in a series of lessons. It is exceptional for a method whole to coincide with the limits of a single lesson period. H. S.

See Recitation, Method of; Steps, Five Formal.

METHODIST EPISCOPAL CHURCH, BOARD OF EDUCATION OF. — See COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

METHODIST EPISCOPAL CHURCH, SOUTH, BOARD OF EDUCATION OF. — See COLLEGE BOARDS IN EDUCATION, DENOMINATIONAL.

METRIC SYSTEM. — A system of measures invented by the French at the close of the eighteenth century, although suggested in part as early as 1670 by Mouton, a priest of Lyons. It is based upon the theoretical average distance from the equator to the north pole. The measurements upon which this average was based have since been shown faulty, so that the standard of length, the meter, is not exactly one ten millionth of this distance, as was contemplated. This has no effect upon the validity of the system, however, since the standards were deposited in the archives at Paris and serve us as a basis for making copies. From the meter came the unit of capacity, the liter, which is a cube that is .1 meter on an edge. From this came the unit of weight, the weight of .001 liter of water at the temperature of greatest density.

The advantages of the metric system over the English and other earlier ones lies in the fact that it is constructed on a decimal scale, like that of United States money. The tables are given in most arithmetics, together with information showing the relation of the metric to our common system, and hence they need not be repeated in this article.

The system was not immediately adopted in France, and, indeed, was not made compulsory until 1837. Even to-day the pound (livre) is still used in small commercial transactions, but it is now taken to be one half of a kilogram. Thus in the home of the system the adoption was slowly made, and the usages of the people have remained to a certain extent. A large number of other countries adopted the system during the latter half of the nineteenth century, so that to-day it is the only international one. The English-speaking countries have, however, declined to look upon it with favor. This may be because of the lack of a centralized power to impose it upon the people, or it may be due to a general feeling of independence on the part of the Anglo-Saxon, but at any rate the movement has been very slow among the people as a whole. Among scientists, however, it has been well received, and between 1875 and 1900 it replaced the old system in the scientific laboratories of the colleges and secondary schools of the United States, and became looked upon as the international scientific system.

Educationally the question arises as to its status in the school curriculum. It is easily taught, and could be put into any grade. The direct need for it does not arise, however, until the pupil studies some branch of science in which it is used. The time, therefore, depends upon the course of study. If elementary physics is taken up in the eighth school year, this is an appropriate place for the system.

There is the larger question as to the prospects of the use of the system by our people. There are two factors to be considered: (1) the simplicity of the tables; (2) the demands of foreign trade. It is impossible to say what the effect of these two factors will be. It is certain that we have, in the United States, greatly reduced our old system in a generation past. Compound numbers are now practically used to only two denominations, the decimal divisions of the mile, acre, and so on, having replaced them. We are therefore decimalizing our units, and this removes to a certain extent the need for the metric system. The question of foreign relations is more serious, because the United States has come to make a strong bid for foreign trade, and is manufacturing for that trade. How much effect this will have upon the introduction of the metric system no one can foresee. It does not seem the business of the school to attempt to influence the development further than to show the advantages of the system, and to prepare the pupil for the work in physics. When the need arises for learning it, any one can acquire it in a short time. D. E. S.

MEXICO, EDUCATION IN. — Mexico: Federal republic consisting of twenty-seven states, three territories, and the Federal District; area 767,323 square miles; population (census of 1910), 1,506,327.

Historical. — The history of public education in Mexico is distinguished from that of the other Latin-American countries by the fact that the Spanish conquerors of Mexico gave evidence of a real appreciation of the importance of public instruction for the masses of the people. In the countries of South America, especially in the Argentine, Chile, and Perú, such attention as was given to public instruction was concentrated on secondary and higher instruction. In these countries, under the leadership of the Church, university instruction reached a relatively high degree of development, whereas primary education was neglected.

This early zeal of the Spanish conquerors for primary education in Mexico did not last long. The enlightened policy which characterized the early period soon gave way to the same indifference to public education which characterized Spanish policy in the other countries of the American continent. As early as 1532 the Spanish authorities had made provision for elementary instruction for one thousand pupils in Mexico City. Unfortunately, trustworthy figures as to the size of Mexico City at that time are not available. If we bear in mind, however, that the Spanish authorities had to deal with a distrustful and even antagonistic native population, we can appreciate the difficulties involved in bringing one thousand children under the influence of the Spanish schools.

Coincident with the opening of the University of Mexico in 1553, there is evidence of a marked decline in the interest in and zeal for elementary instruction. The attention of the government, as well as the funds available for public education, were diverted from primary to higher education. Soon after the middle of the sixteenth century Spanish policy in Mexico begins to conform to the traditional policy of Spain; namely, the neglect of primary education, combined with a relatively advanced development of university instruction. The result of this change was the total neglect of the real needs of the native population, inasmuch as the university courses in theology, civil law, canon law, and medicine were intended exclusively for the sons of Spanish residents. It is true that in the newly founded university a number of courses in the native languages were given, but these were intended to prepare Spanish priests for missionary work among the native Indian tribes.

The records of the development of public education during the colonial period are so incomplete that it is difficult to form an accurate estimate of the facilities offered by private agencies. It is evident, however, that after the first and rather extraordinary development of primary education during the early period, the system of elementary instruction was permitted to decline to such a degree that its facilities were extended to but a small fraction of the school population. The university developed with extraordinary rapidity, and remained an important factor in the intellectual life of Mexico during the entire colonial period.

With the Declaration of Independence, new influences began to make themselves felt. The determination of the government to improve the condition of the masses of the people becomes clearly apparent, and this desire expresses itself in a series of attempts to develop a system of primary education. The long period of civil war which followed soon after the Declaration of Independence, and which kept Mexico in a state of agitation and upheaval during the first six decades of the nineteenth century, made it impossible to carry out any of the plans for the development of primary instruction. During this period of anarchy the university also failed to receive adequate support, and when in the early sixties the struggle between Church and State became acute, the university organization was abolished.

Elementary Schools. — The adoption of the Constitution of 1853 marks an epoch in the history of elementary instruction in Mexico. The adoption of this constitution was accompanied by a wave of popular enthusiasm for republican institutions and a revival of interest in popular education.

With the inauguration of President Juarez in 1858 the government undertook the formulation of a systematic plan for the development of primary education. Unfortunately, the provisions of the Constitution of 1853 did not give to the federal government the powers necessary to develop a national system of education. The framers of the instrument in determining the distribution of powers between the federal and the state governments followed, in the main, the provisions of the Constitution of the United States, but in so doing failed to realize that the states forming part of the federal system did not possess either the financial resources or the enlightened public opinion necessary to insure the growth of a vigorous system of public instruction. It was taken for granted that inasmuch as under the political system of the United States primary education had reached a high degree of development under the direction of the individual states, the same results would be secured in Mexico. The period that has elapsed since the adoption of the Constitution of 1853 has served to demonstrate the erroneousness of this view. The limited income of most of the states has made it impossible for them to appropriate for public education even a small percentage of the sum necessary to overcome the alarming illiteracy prevailing throughout the republic.

There is but little doubt that had the federal government been able to secure complete control of public education the system would have made far greater advances during the last half century. This is due primarily to the fact that the revenues and credit of the central government are far in advance of those of the individual states. Furthermore, the fact that the states have failed to develop a distinctive and vigorous political life and that their administrative system is not thoroughly organized makes it difficult for them to secure the expert direction necessary for the growth of a vigorous system of public education. The magnitude of the problem confronting the country can best be seen from an examination of the data relating to illiteracy. Significant as they are, it is likely that they underestimate rather than exaggerate the degree of illiteracy that prevails.

Statistics of Illiteracy in Mexico

	Male	Female	Total
Persons 12 years or over, who can neither read nor write	3,119,944	3,664,680	6,784,624
Persons less than 12 years of age who can neither read nor write . . .	2,118,843	2,010,299	4,129,142
Persons concerning whom no information could be obtained	76,438	89,564	166,002
Persons who can read and write	1,273,325	906,263	2,179,588
Persons who can read but cannot write	163,568	184,335	347,903

In the central group of states, with 6,239,038 inhabitants, but 1,002,692, or about 15 per cent of the total population, can read and write. In the northern group of states, with a population of 1,174,341, but 287,777 can read and write. In the five Gulf states, with a population of 1,756,006, but 280,087 can read and write; and in the states and territories of the Pacific coast of a total population of 4,437,874, but 609,032 can read and write. These figures are taken from the census of 1900. Unfortunately, no trustworthy statistics as to illiteracy are available, which would enable us to measure the advance that has been made during the last ten years.

Although the federal government exercises no direct control over public education within the states of the union, there exists throughout the republic practical uniformity in organization.

Primary instruction includes five years of elementary grades and two years of advanced grades. The course of study in these schools has been carefully worked out, but the greatest obstacle in the way of efficient service is the failure to pay anything approaching adequate compensation to teachers. Even in the Federal District, where salaries are much higher than in the states, the principals of primary schools receive but $730 per annum. The compensation of teachers ranges from $328.50 to $547.50 per annum, depending upon the degree of preparation and term of service. It is evident that with such low salaries, teaching as a profession does not offer much to allure young men and women, and it is not surprising that the government should find great difficulty in securing competent candidates for the available positions.

The Training of Teachers. — The inadequacy of the facilities for the training of teachers is a matter which has been dwelt upon by every writer on the educational system of Mexico. During the last few years a strong effort has been made in all the states, but especially in the Federal District, to improve this branch of the educational system. The improvement has been due in large part to the influence of the national Department of Public Education, and to the example set by the two excellent normal schools of the Federal District. The new building which has been erected for the men's normal school is thoroughly equipped and modern in every respect. In order to induce young men to enter the teaching profession the government has provided liberally for scholarships and stipends. The Normal School for Women in the Federal District occupies an old building which is not adapted to its purposes. In spite of the inadequate accommodations, however, the school is doing excellent work, and compares favorably with most of the normal schools in the United States.

The course of study in the normal schools covers a period of five years, and includes the following subjects: —

First Year. — Language; Arithmetic; Botany Elements of Zoölogy; Composition; Drawing; Manual Training; Singing; Physical Training, and (for the men) Military Drill.

Second Year. — Language; Algebra; Geometry; Elements of Physics; Elements of Physiology and Anatomy; Principles of Hygiene; Drawing; Manual Training; Physical Education; Harmony.

Third Year. — Language; Elements of Chemistry; Mineralogy; Elements of Psychology; Geography; Drawing; Manual Training; Harmony; Physical Education; Observation in the School of Practice.

Fourth Year. — Spanish Literature; Logic; Geography; History of Mexico; Pedagogy; Physical Education; Observation and Instruction in the School of Practice.

Fifth Year. — Literature; Ethics; Civics; General History; Civic Instruction; All the Natural and Physical Sciences; Pedagogical Organization; Discipline and Administration; History of Pedagogy; School Hygiene; Physical Education.

Manual, Technical, and Vocational Training. — In a country like Mexico, in which the native Indian population was for so many years kept in a condition of social subjection bordering on serfdom, without any attempt to develop economic efficiency, the need of the present day is a well-developed system of vocational and industrial training. During the colonial period, and in fact during the greater part of the nineteenth century, little or no attention was given to this phase of education. To-day the statesmen and educators of Mexico realize that national effort must now be concentrated on the problem of making the native Mexican a more efficient worker.

During the last ten years the movement for the introduction of manual training into primary schools, both in the Federal District and in the states, has acquired considerable force. Those who are directing the educational policy of the country fully realize that the fundamental need of the great mass of the Indian population is the kind of training that would turn the attention of the younger men to the mechanical arts. Mexico lacks a native artisan class. The overcrowding of the legal and medical professions has become a serious problem in all the Latin-American countries, and is traceable to the continuance of the old Spanish prejudice against trade and commerce. This tendency has been strengthened by the purely dialectic character of the curriculum of the secondary schools, which are molded after the French system. The introduction of manual training, therefore, into the normal schools of the Federal District with a view to preparing the teachers for this type of instruction possesses a significance in Mexico far greater than in many other countries.

In the matter of vocational training, a beginning has been made in the Federal District, and also in some of the states, notably Chihuahua, but it is true that this movement is still in its infancy. In the Federal District there is an excellent trade school for boys and another for girls.

The school for boys prepares for the following trades: carpentering; woodworking; iron work; decorative painting and sculpture; electrical and industrial mechanics. For each of these, special courses are prescribed.

The School of Industrial Arts for Girls includes the following courses: typewriting; bookkeeping; stenography; sewing; dressmaking; hat making; artificial flower making; embroidery; lace making; wig making; hair dressing; domestic science. In addition a number of courses is taken by all pupils in natural history, physics, and chemistry. In this school over a thousand pupils are registered. It is the purpose of the federal authorities to increase the number of these schools.as rapidly as the resources of the government will permit.

Commercial Education. — The introduction of commercial education, especially in its higher grades, is another of the recent changes in the system of public education. The first step in this direction was taken through the introduction of commercial courses in the higher grades of the primary schools of the Federal District. The next step was the establishment of a commercial section in the national secondary school, and the final step in this movement was the establishment of a commercial high school in the national capital. In the states but little has been done in this respect. Through the influence of the former governor of Chihuahua a commercial school was established in the capital of that city.

Secondary Instruction. — The instruction corresponding more or less closely to the high schools of our American system is given in the so-called *Escuelas Preparatorias*, or preparatory schools. The organization, as well as the curriculum of these schools, is patterned after the French *Lycée*, and is designed to prepare students for the professional schools of the university. The system of secondary instruction is well organized in the Federal District, but constitutes the weakest link in the chain of education in most of the states. The most serious criticism to be made is the undue emphasis laid on examinations and the failure to keep in close touch with the work of the pupil during the course of the scholastic year. In every subject a series of printed questions is furnished the pupil, and in most cases his preparation consists in an attempt to memorize the answers to a disconnected series of questions, rather than to secure a broad grasp of any of the subjects.

A serious attempt is now being made to reduce the number of subjects taught, and to require a more thorough training in a few fundamental courses. If this change is made, it will constitute a marked improvement over the present system. The course of study covers a period of five years, and includes the following subjects: —

First Year. — Algebra; mathematics; geometry; Spanish; French; drawing; manual training.

Second Year. — Advanced mathematics; Spanish; French; English; drawing; manual training.

Third Year. — Mechanics; physics; Spanish; English; drawing; manual training.

Fourth Year. — Chemistry; mineralogy; botany; geography; English literature; Spanish literature.

Fifth Year. — Zoölogy; elements of anatomy and physiology; psychology; logic; general history; Mexican history; ethics; Spanish literature.

Higher Education. — The movement for the establishment of a university in Mexico was initiated by Charles V, in 1551, but no courses were offered until 1553. From that time until the final abolition of this institution by the Juarez government in 1867, the only university organization existing in Mexico was under the direct control of the Catholic Church. As the demand for higher education, and especially for professional training, became more insistent, the government established a series of independent professional institutions. The medical school, the law school, and the engineering school grew up independently, each with its own director responsible to the Minister of Public Instruction. This form of organization proved unsatisfactory for many reasons, but especially because it prevented the development of any unity of purpose in higher education and was a permanent obstacle to the growth of that university spirit which exerts so marked an influence on the life and thought of the student body.

The necessity for closer coördination of university instruction became so pressing that the government finally decided to correlate the work of the several independent faculties. The centennial anniversary of Mexican independence was made the occasion for the inauguration of this plan. Under the law of May 26, 1910, the existing schools of law, medicine, engineering, and architecture were made integral parts of the new National University of Mexico. To this a graduate school was added, intended for the conduct of special research in every field of science. The National Preparatory School in the city of Mexico was also made an integral part of the new university organization.

The university is placed under the control of a president, designated as the Rector, and a university council, composed of the president of the university, the deans of the professional schools and the director-general of primary instruction. In addition, four members are designated by the Minister of Public Instruction, and two representatives from each of the professional schools are elected by the respective faculties. The student body is also represented on the university council by a provision which gives to the students in each of the professional schools the right to elect one of their number as their representative on the council. The council is given wide powers over university organization and administration, but the final authority in all important questions is vested in the Minister of Public Instruction. The official inauguration of the university took place on the 22d of September, 1910. It is, of course, too early to express any opinion on the operation of the new system. The results thus far attained, however, are sufficient to indicate the importance of the step that has been taken. A spirit of solidarity among the students, as well as in the teaching staff, is rapidly developing. The coöperation that has been established between the various faculties is improving not only the content of the courses, but also the spirit of university instruction.

Present Needs of the Educational System. — The experience of the last twenty-five years points clearly to the necessity of increasing the authority of the federal government in all matters relating to public education. With the nationalization of education Mexico will be able to meet two most pressing needs; namely, the extension of the system of manual and vocational training and the introduction of a well-organized system of agricultural instruction. Mexico is at present, and will for a long time continue to be, an agricultural country. Her greatest social as well as economic need is a small land-owning class. Recognizing this fact, the government has devised a plan for the allotment of small holdings, which involves the purchase of great estates and their subdivision into small farms. It is not likely, however, that this plan will be successful until agricultural education has become an integral part of the system of public instruction. This will mean that the curriculum of the rural schools will have to be changed in order to introduce those subjects which will attract the attention of the younger men of the country to agricultural pursuits. The Minister of Public Instruction has devised a plan with this end in view. A modest beginning has been made, but it is likely that the next few years will witness a marked development in this direction.

L. S. R.

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MIALL, EDWARD (1809–1881). — English politician and Nonconformist minister, born at Portsmouth and educated at St. Saviour's Grammar School, London. After serving as usher in private schools, he was trained for the independent ministry. Receiving a call to Leicester, he was brought into intimate touch with the working classes. In 1840 he began to interest himself in politics and was strongly opposed to the established church and the Tory government. Adopting the *laissez-faire* principle, he was opposed to compulsion of all kinds, and in 1847 he delivered a lecture at Crosby Hall for the Congregational Board of Education, *On the Non-Interference of the Government with Popular Education.* In this address he strongly upheld the advantages of voluntarism. " The will of man to do good is usually most lusty and vigorous when compelled by circumstances . . . to 'rough it' . . . When all is smooth and mechanical the spirits flag." Authorized education would kill spontaneity and intelligent and disinterested care. In a scheme of state education there was the danger also that a man might be taxed to spread opinions which he did not himself hold. Miall sat in the House of Commons from 1852 to 1857 and from 1869 to 1874. In 1870 his views on compulsory state education had changed, for he supported the Forster bill, and only criticised it because he regarded it as too favorable to the established church. Miall's chief service in English politics was to weld together and secure Parliamentary representation for a party strongly opposed to the established church, whose organ, the *Nonconformist,* he had founded in 1841.

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MIAMI UNIVERSITY, OXFORD, OHIO. — A coeducational institution founded by act of legislature in 1809, although as early as 1789 a proposal had been made for the grant of land for an academy or college. Instruction was begun in a log building, maintained as a "grammar school" until 1818, when a brick structure was erected. The school was raised to collegiate rank in 1824, and the first class was graduated in 1826. The institution made rapid progress under the first president, Robert H. Bishop. Annual state appropriations were not made until 1885. In 1902 the Ohio State Normal College was established in connection with the university, and gives two-year courses for grade teachers, manual training, art, music, domestic science, and rural industrial education. A summer course is also maintained in this department. Admission to the College of Liberal Arts is by certificate from accredited schools or by examination, the entrance requirements being fifteen units. Studies are arranged in a system of groups and free electives, and lead at the end of four years to the A.B. degree. The enrollment in 1911–1912 was 333 students in the college, 173 in the normal college, and 548 in the summer term. The permanent staff consists of fifty-six members.

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MICHELET, JULES (1798–1874). — The French historian was teacher of history at the Collège Sainte-Barbe and at the Ecole Normale, investigator in the Record Office, assistant professor at the Sorbonne under Guizot, and professor of history at the Collège de France (1838). Deprived of his government positions through the political overturn of 1851, he was thenceforth compelled to make his way by his pen. His most famous work is his *Histoire de France*, in eighteen volumes (1833–1867). Among his other works are: *Précis d'Histoire moderne* (1828); *Histoire de la République romaine* (1831); *Introduction à l'Histoire universelle* (1831); *Origines du Droit français* (1837); *L'Oiseau* (1856); *L'Amour* (1859); *La Sorcière* (1862); and *Nos Fils* (1869), this last being his chief educational writing. F. E. F.

MICHIGAN AGRICULTURAL COLLEGE, EAST LANSING, MICH. — A state institution established by legislature in 1855 through the influence of the Michigan State Agricultural Society. This was the first state institution in the United States offering instruction in scientific and practical agriculture. It is under the control of the State Board of Agriculture. The entrance requirements are fifteen units. Five-year courses are offered to those candidates who have not completed a high school course. The following courses are offered: agriculture, engineering, forestry, home economics, leading to B.S., and the veterinary, leading to the D.V.S. Special short courses in agriculture and courses for teachers of agriculture are also given. The enrollment in all departments in 1911–1912 was 1702. The faculty consists of 140 members.

MICHIGAN COLLEGE OF MINES, HOUGHTON, MICH. — Established by act of legislature in 1885 under the government of a board of control appointed by the governor. The institution is located in the heart of the great copper mining region of Lake Superior. Students are admitted by examination or diploma. The degrees of B.S. and Engineer of Mines are conferred on completion of the appropriate requirements. The enrollment in 1911–1912 was 222. The teaching staff consists of thirty members.

MICHIGAN, STATE OF. — A part of the Northwest Territory, organized as a separate territory in 1805, and admitted as the twenty-sixth state in 1837. It is located in the North Central Division, and has a land area of 57,430 square miles. In size it is about as large as the six New England states, or England and Wales combined. The state consists of two peninsulas, which for administrative purposes are divided into eighty-three counties, and these in turn into townships or school districts. In 1910 Michigan had a population of 2,810,173, and a density of population of 48.9 per square mile.

Educational History. — The early history of education in Michigan is largely the history of education in and about Detroit, a number of private and church schools of an elementary nature having been organized there before the organization of Michigan as a territory, the earliest date mentioned being 1755. In 1809 the first school act was passed, but was not even printed, and doubtless was a dead letter from the very first. It directed that populated territory should be laid off into school districts, a school census taken, and a tax levied, the proceeds to be apportioned to the districts in proportion to the amount spent the preceding year for schools. No further attempt to enact a general school law was made until 1827. In 1817, an act was passed creating the "Catholepistemiad, or University of Michigania," which provided not only for a single institution of high rank, but the faculty was also empowered "to establish colleges, academies, schools, libraries, museums, botanic gardens, laboratories, and other useful literary and scientific institutions," and to appoint teachers and other school officers in all the counties, towns, and cities of the territory. The central territorial government was to defray the expenses of all education. In 1818 a Lancasterian elementary school was opened in Detroit as a part of the scheme. In 1821 the 1817 law was revised, the University of Michigan established, and a board of trustees created to manage all the schools forming part of it. In 1837 the institution was organized, and in 1841 it opened its doors to men students for the first time. Women were not admitted until 1870.

In 1827 a new school law, which provided for a system of common schools throughout the territory and independent of the university, was enacted. The new law was modeled after the early school law of Massachusetts. Every township containing fifty families was required to support a primary school for six months; townships of one hundred families, a primary school for twelve months; townships of one hundred and fifty families, a primary school for six months and an advanced school for twelve months; and townships of two hundred families must, in addition, employ a grammar school master. The system was a township system, with a proviso, however, that the voters of a township might order the division of the township into districts and elect district boards of three trustees annually. By a two-thirds vote of the electors the law could be nullified in any township. The schools were to be sustained by the rents from the school lands, and a tax on the property of residents. In 1829 the property of nonresidents was also included. A little later the township tax was abolished, except for indigents and schoolhouses, and the "rate bill" system was substituted for taxation. A superintendent of common schools was appointed to look after the school lands, and in 1836 this official evolved into a Superintendent of Public Instruction.

The constitution of 1835, adopted in preparation for entrance into the Union, made detailed provision for a state school system, and contained a definite mandate to provide a system of common schools whereby a school should be kept up and supported for three months each year in each school district of the state. The school laws of 1837, enacted in response to the mandate of the constitution, provided for a system of schools to be maintained in part by state appropriations, in part by local taxes, and in part by the rate bill. The law of 1837 drawn up by John D. Pierce, called the father of the Michigan school system, forms the foundation of the present system. Some progress was made in the better settled communities, but very little elsewhere. Detroit organized a graded school system under a board of education, in 1842, and provided free schools for its children, and in 1846 union district graded schools were permitted in the state for the first time. By 1850 seven such graded schools had been formed; by 1860, eighty-five; and after 1860 the progress was rapid, there being 248 by 1870, 389 by 1880, 513 by 1890, and 711 by 1900. A state institution for the deaf, dumb, and blind was established in 1848, and a separate institution for the blind was established in 1880. The state normal school at Ypsilanti was established in 1849, and an *ex officio* State Board of Education was created to manage the school.

In 1850 a new constitution was adopted which made much more detailed provision for a system of public education. An elected, instead of an appointed, Superintendent of Public Instruction was provided for; the school land fund was safeguarded; the legislature was ordered, within five years, to provide free primary schools, although it did not do so for nineteen years; a three months' school was ordered in every district; the method of election and functions of the board of regents for the university were specified; an elected instead of an *ex officio* State Board of Education, to manage the state normal school, was provided for; and township libraries were ordered to be established.

The first teachers' institute was held in 1846; in 1855 they were first authorized by law, and in 1877 county institute funds were created by requiring teachers to pay fees for examinations and certificates. In 1855 the State Agricultural College was established. Until 1861 this was under the control of the State Board of Education, but in that year it was transferred to the State Board of Agriculture. In 1855 an industrial school for boys was established, and in 1879 one was also established for girls. In 1871 a state institution for dependent children was established, and in 1880 a separate institution was established for the blind. In 1859 districts were permitted to organize high school departments, and in 1871 the University of Michigan began the accrediting system (*q.v.*) for entrance to the university. In 1869 the "rate bill" was abolished, and the schools finally were made free.

In 1867 a law was enacted creating county superintendents for each county, and establishing a form of the county system of school administration. The certification of teachers, which since 1837 had been in the hands of the township school inspectors, was now given to the county superintendent. In 1875 this law was repealed, township superintendents were created, and the certification was given to them. As this did not prove satisfactory, a board of three examiners for each county was created in 1881, and certification was given to them. In 1887 the law was revised so as to reduce the number of examiners from three to two, and the two were required to elect a secretary, who examined all teachers and acted as the executive officer of the board. In 1891 the secretary was changed into a county commissioner of schools, to be elected by the people. In 1879 the State Board of Education was directed to prepare questions for county teachers' examinations, and in 1887 their use by county examiners was required. From 1867 to 1875 the State Superintendent was empowered to grant state teachers' certificates, but in 1879 this power was given to the State Board of Education.

In 1871 the first "act to compel children to attend school," was passed, and in 1885 the first "act regulating the employment of children" was enacted. In 1885 the city of Saginaw was permitted to provide free textbooks, and in 1889 a general free textbook law was enacted for the state. In 1891 school boards were authorized to establish kindergartens, and the power to issue certificates to certain of its graduates was granted to the University of Michigan. In 1895 the Mt. Pleasant normal school, established privately in 1891, was accepted by the state. In 1899 a third state normal school was established in the northern peninsula at Marquette, and in 1903 a fourth state normal school was authorized to be established in the western part of the state. The same year normal training classes were also authorized for any county not having a state normal school.

In 1908 a new state constitution was adopted. The State Superintendent was made *ex officio* a member of the State Board of Education, and of all other boards having control of public instruction in any state institution; the State Board of Agriculture was made a constitutional body, and its duties defined; the election of the Superintendent, the State Board of Education, and the State Board of Agriculture was changed from the November to the April elections; the maintenance of the university, the college of mines, the agricultural college, and the state normal schools was made mandatory; boards of township inspectors were abolished; and the minimum school term was raised from three to five months. Otherwise there were only verbal changes from the constitution of 1650. The legislature of 1909 established an educational and professional standard for the offices of State Superintendent and county commissioners; required districts to pay high school tuition for their pupils, and also authorized transfers; required instruction as to communicable diseases; and provided for state aid to agricultural high schools. The legislature of 1911 empowered districts to establish trade, vocational, industrial, marine, and manual training schools.

Present School System. — At the head of the school system of Michigan is a State Superintendent of Public Instruction, elected by the people at the April elections for two-year terms. He is paid $4000 per year; must be a graduate of a university, college, or normal school, and have taught five years in Michigan. He is a member, *ex officio*, of all boards of an educational nature in the state, but without a vote. He has general supervision of public instruction in all of the public schools of the state and in all public institutions which are educational in character; may require cities and districts to provide proper educational facilities, and may bring suit to enforce the law; may inspect the books of any school unit; must prepare rules for the management of township and district libraries; must apportion the school money to the townships and cities; must authorize the establishment of new county training schools; may request the governor to remove any county commissioner, or examiner; and must prepare an annual report to the governor and legislature.

The State Board of Education consists of four citizens, two elected at each biennial spring election, and the State Superintendent of Public Instruction, *ex officio*. The board is a body politic and corporate; has control of the courses of instruction and the management of the four state normal schools; grants certificates to teach to graduates of these schools; examines candidates for life diplomas; may approve teachers' certificates and life diplomas from other states; may approve the pedagogical course in colleges and universities, other than the University of Michigan, for the teacher's certificate; adopts a textbook in physiology and hygiene for use in the schools; and makes an annual report to the governor. The board must meet at least twice each year, and the members are paid $3 per day and expenses for their services.

For each county the voters elect a county school commissioner, at the April elections, for a four-year term. The board of county supervisors fixes the compensation of the commissioner and his deputies, if he has any. On the recommendation of the State Superintendent he may be removed from office by the governor. To be eligible, each county commissioner must have had twelve months' experience as a teacher in the schools of Michigan, and must be a graduate either of a college or of a normal school, or hold a first-grade teacher's certificate. In counties having fifty or less teachers a second-grade teacher's certificate will answer. It is his duty to keep a record of all examinations held, sign all teachers' certificates, keep all records; collect the institute fees; furnish the township clerks with a list of authorized teachers; visit each school at least once each year; and make an annual report to the State Superintendent and act subject to his instructions. His powers and duties are rather limited, and his salary very small. The county supervisors appoint two county examiners, for two-year terms, and these, together with the county school commissioner, constitute the county board of examiners. The examiners must hold valid teachers' certificates. They give two examinations each year, and an extra examination in October, using questions prepared by the State Superintendent of Public Instruction.

Below the county school authorities are the township officials, and the townships may be still further divided into districts. In the northern peninsula the township organization has supplanted the district organization, and in the southern peninsula, the beginnings have been made. Where the township organization has been instituted, a township board of five trustees, elected at large, controls the schools of the township, outside of cities and graded school districts. This board reports to the township clerk and treasurer, and to the county commissioner. Elsewhere, where the district form of organization prevails, annual school meetings are held in July in each district, and each school is under the management of a board of three district school officers, elected for three-year terms, consisting of a moderator, director, and treasurer. This board is a body corporate and politic, may build schoolhouses, estimate and vote money for maintenance, hire teachers, purchase books for indigents, make rules and regulations, admit and suspend pupils, and must take an annual school census and make an annual report to the district meeting in writing, and to the township clerk. The director usually has charge of the schoolhouses and grounds, makes purchases and repairs, acts as clerk of the district, and compiles the annual reports. The treasurer keeps all accounts, pays all bills, and reports to the township treasurer. The township clerk reports to the county school commissioner.

An annual meeting of school officers of each county is held by the county school commissioner, and one member from each district or township board is expected to attend. He is allowed $2 per day and expenses for so doing. Graded school districts may be formed in any district, or by two or more contiguous districts, by a majority vote at any annual school meeting. For such, a board of education of five is elected at large, and, if the district employs six teachers, it may also employ a superintendent. Such a district may also establish a high school. On petition of one third of the taxpayers of any township not having in it an incorporated city or village, the township board shall submit to a vote the question of forming a rural high school. If adopted by a majority, a board of three trustees is elected to manage the school and to raise taxes for it. The course of instruction is fixed by the State Superintendent. Very few such schools have so far been formed. Boards of trustees in districts not maintaining a high school may pay tuition and transportation of pupils in neighboring high schools. Any township, city, or district may maintain a school library, and any township may divide its library among the school districts. A librarian may be appointed, and any township may levy an annual township library tax. All county fines for breaches of the penal laws go to the county library fund, and the state also makes an annual grant. Such funds are apportioned to the different townships, cities, and districts maintaining libraries, on the basis of the number of school census children in each. A State Board of Library Commissioners, appointed by the governor, and consisting of four citizens and the state librarian, *ex officio*, advises with libraries as to their work, and all free libraries report to them through the county school commissioners. This board is allowed $4800 per year for its work. Nearly all townships and districts report libraries, the township libraries averaging about 1000 volumes, and the district libraries about 600 volumes. Each township, city, or district selects its own textbooks and contracts directly with the publishers, and any district may vote at an annual meeting to provide free textbooks. About one sixth of the districts provide free textbooks. Any district may establish a day school for the oral instruction of deaf children, and the state will grant aid up to $150 per year per pupil.

School Support. — The state originally received 1,067,397 acres of land from Congress from the sixteenth-section grants made to the states for education, two townships of land (46,080 acres) for a seminary of higher learning, and 240,000 acres for a college of agriculture and mechanical arts. In 1850 Congress also gave to Michigan 5,838,775 acres of swamp land for schools. The two funds now amount to about five and a quarter million of dollars. The state pays interest on the sixteenth-section fund at 7 per cent, and upon the swamp-land fund at 5 per cent, and the income is distributed to the schools on the basis of school census, being worth about forty-seven cents a child at present. The two college funds now amount to about a million and a half, and the income is about $100,000 a year. There is also a normal school fund of $68,822, which produced $4168 for the normal school in 1910.

To the income from the sixteenth-section funds is added the surplus from specific state taxes (corporation taxes), which vary somewhat from year to year, but amount to about three quarters of a million dollars annually. The addition of the surplus taxes has caused the state apportionment to increase from forty cents to fifty cents per pupil, between which it varied up to 1880, to $1.33 by 1890, $2.15 by 1900, $3.50 by 1905, and to about $6 at present. The total sum is apportioned by the State Superintendent to the counties, and by the counties to the townships and districts, on the basis of school census. This pays a little more than one half of the cost of the school system. A township one-mill tax is levied, which is apportioned to the districts on the basis of the amount each pays. The remainder (about 40 per cent) comes from additional local taxation. The undesirability of the school census as a basis for the apportionment of school funds (see Apportionment of School Funds) is nowhere better illustrated than in Michigan, where some districts have a struggle for existence, while others possess accumulations sufficient to run the schools for many years. At the date of the last report, 861 school districts had enough teachers' wage money on hand at the end of the year to run the schools for at least two years, while some had enough to run the schools from ten to twenty-two years.

The total amount expended for the maintenance of schools for the last year for which reports are available was $13,223,773, or a per capita of the total population expenditure of $4.70. The average term provided is about eight and one half months. The percentage of attendance based on enrollment averages about 70 for the state, while in the city districts it averages a little over 95.

Educational Conditions. — The southern part of the state has a number of important manufacturing cities, but the northern part is sparsely settled. About 30 per cent of the total population live in these southern cities, about 10 per cent in small towns, and 60 per cent under rural conditions. The larger southern cities (Detroit, Grand Rapids) are very cosmopolitan, but the rural sections are largely of American and Canadian stock. The average for the state is about 75 per cent native. Only about $\frac{1}{2}$ of 1 per cent of the total population is of the negro race, and separate schools on account of race or color are prohibited by law. The percentage of illiteracy is comparatively low, being but 4.2 per cent and confined almost entirely to the foreign population in the cities.

The state has a good compulsory education law, with fairly effective means for its enforcement, all children seven to sixteen years of age being required to go to school the whole time the public schools are in session, unless excused for certain specific reasons. The employment of children under fourteen during school time is prohibited, but children from fourteen to sixteen may be allowed to work if they have completed the eighth grade, and if they have a work certificate from the school authorities. The sheriff of each county must appoint a county truant officer, who is allowed $3 a day and expenses. Teachers must verify census lists, and report absences to the county commissioner. Deaf pupils must also go to the day schools for the deaf, or to the state school for the deaf. Blind children, with certain exceptions, must also go to school. Any school board may establish an ungraded school for truants. Disorderly or incorrigible boys under sixteen, and girls under seventeen, may be sent to the state industrial schools.

The state has good schoolhouses, the 8453 schoolhouses in the state averaging about $4000 each in value. Many towns and cities, as well as many country districts, have schools of high grade. On the other hand, many village and town schools are inadequately financed, and are of low grade. This inevitably happens in a state using the census basis of apportionment as the sole basis. Agricultural instruction has been made a marked feature during recent years, and manual training and domestic science have been introduced in many places. The consolidation of schools has made some headway in the better settled portions of the state, and the township unit, which leads to similar results, is being urged for adoption generally in the southern peninsula, as it has been in the northern.

Teachers and Training. — The state employed approximately 15,000 teachers in 1910, about one half of whom were employed in ungraded rural schools. About 17 per cent of the total number were men. Five grades of certificates are granted on examination. The first and second grades require previous teaching experience of nine and seven months, and are valid for four and three years respectively. The third grade " A," for primary work only, requires three years' previous experience, and is valid for three years. The third grade " B " and " C " are valid for one year only, " C " being limited to a particular district. Graduates of the state university and of the Southern Agricultural College receive certificates, on certain conditions, and the State Board of Education may accredit other colleges. Normal school graduates are also certificated on graduation, and normal school diplomas from other states may also be endorsed by the State Board of Education. Cities employing a superintendent may certificate their own teachers, if they so desire.

The state maintains four state normal schools for the training of teachers, located at Ypsilanti (1852), Mt. Pleasant (1895), Marquette (1899), and Kalamazoo (1903). These maintain regular normal school courses, and each must also maintain one course preparatory for rural school work. A marked feature of the Michigan system for the training of teachers is the county training school. Since 1903, in any county not containing a state normal school, any district and the board of supervisors of the county may vote to unite in establishing a county training school (see TEACHERS, TRAINING OF) for the better preparation of teachers for the rural schools. The establishment of any school must be authorized by the State Superintendent of Public Instruction, and he, together with the county commissioner of the county and the superintendent of the schools of the district, constitutes the county training school board. They regulate admissions, establish a one year's course of study, and grant diplomas of graduation. Graduates may teach, for three years, in any school in the county not having over two teachers, and the board may renew the certificate on evidence of success. The state grants aid of $500 for each training school teacher employed, up to two teachers, and the county grants aid up to one half of what the state gives. Before 1903 less than 2 per cent of the rural teachers of Michigan had had any professional training, while now over 30 per cent have had at least one year of professional preparation. About fifty such schools were in operation by 1910. Teachers' institutes are held in each county each year, and all male teachers are assessed $1 and female teachers fifty cents each year to provide an institute fund.

Secondary Education. — The high school system of the state is well organized, there being about 400 public and private high schools in the state, nearly all of which maintain a four-year course and close relations with the University of Michigan (see ACCREDITED SCHOOLS). In 1907 county schools of agriculture were authorized. Any county, or two or more adjacent counties, may vote to maintain such a school, which is placed under the management of a county board of education, consisting of the county school commissioner and four citizens appointed by the county supervisors. The schools must teach agriculture, domestic science, and manual training. The course of instruction is determined by the State Superintendent and the president of the agricultural college. Such schools must have ten acres of land. If the school has cost $20,000 and has 100 acres of land, the state will grant aid up to two thirds the cost of maintenance, but not over $4000.

Higher and Special Education. — The state maintains the University of Michigan (*q.v.*) at Ann Arbor, opened in 1841, which is one of the largest and best of the American state universities, and one which has long rendered important service. The state also maintains the Michigan Agricultural College (*q.v.*) at East Lansing, opened in 1857; and the Michigan College of Mines (*q.v.*) at Houghton, opened in 1886. These stand as the culmination of the system of public instruction provided by the state. In addition to these, the following institutions within the state offer collegiate instruction: —

INSTITUTION	LOCATION	OPENED	CONTROL	FOR
Albion College	Albion	1843	M.E.	Both sexes
Hillsdale College . . .	Hillsdale	1855	Nonsect.	Both sexes
Kalamazoo College . . .	Kalamazoo	1855 (?)	Bapt.	Both sexes
Adrian College	Adrian	1859	Meth.Prot.	Both sexes
Olivet College	Olivet	1859	Cong.	Both sexes
Hope College .	Holland	1866	Refd.	Both sexes
Detroit College	Detroit	1877	R.C.	Men
Alma College .	Alma	1887	Presby.	Both sexes

The state also maintains the Michigan School for the Blind, at Lansing; the Michigan Employment Institution for the Blind at West Saginaw; the Michigan School for the Deaf, at Flint; the Michigan State Public School for poor and dependent children, at Coldwater; the Michigan Home for Feeble-Minded and Epileptic Children, at Lapeer; the State Industrial Home for Girls (reformatory), at Adrian; and the Michigan Industrial School for Boys (reformatory), at Lansing. E. P. C.

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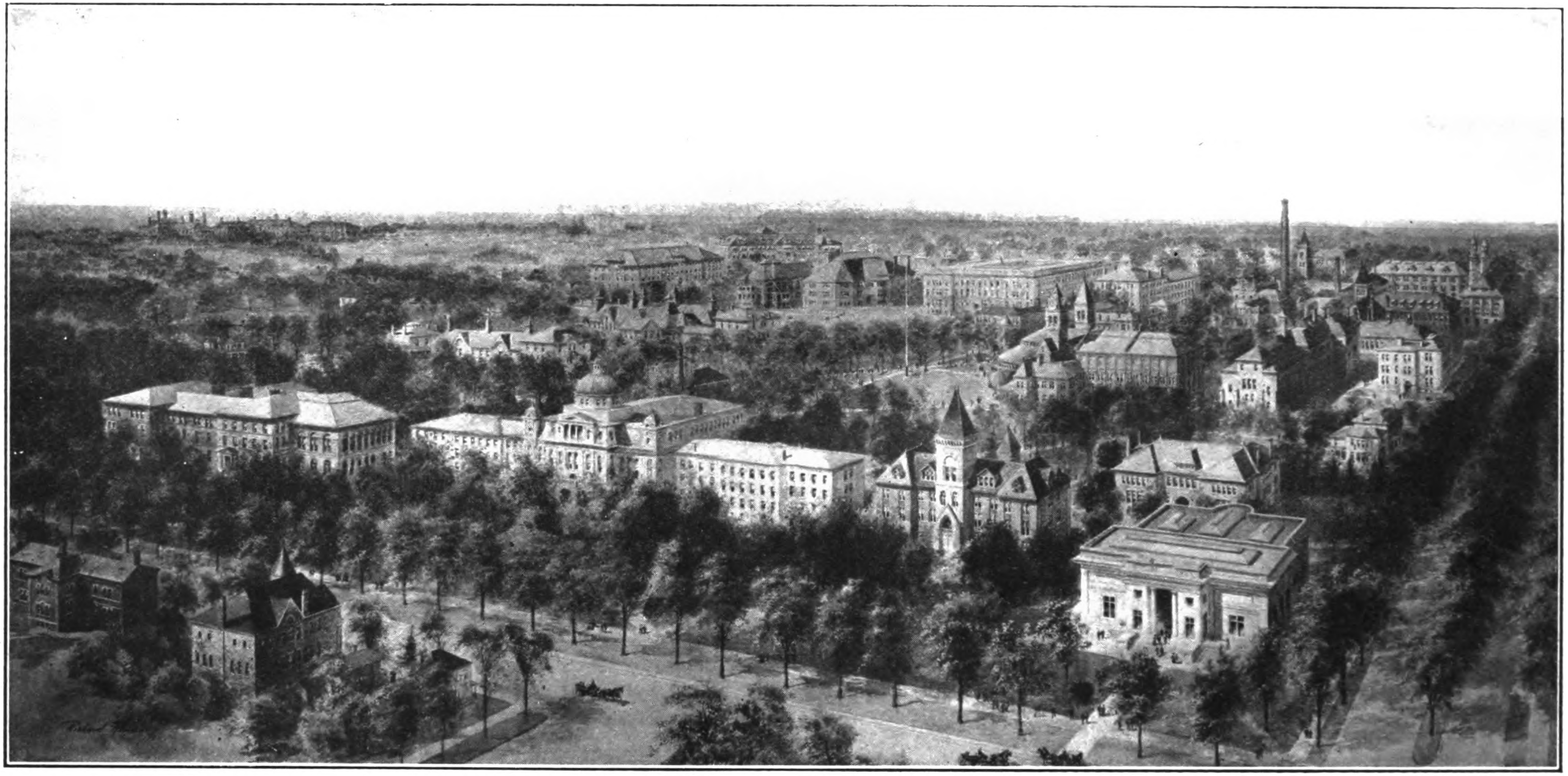
MICHIGAN, UNIVERSITY OF, ANN ARBOR, MICH. — The first of the state universities to take and hold a position of prominence and leadership among American universities. It was the first institution to utilize with some degree of wisdom the Congressional land grants, made from 1787 onwards, for the promotion of higher learning in the newly created states. The Constitution of 1835 under which Michigan came into the Union made it obligatory upon the legislature to create from the sale of these lands a permanent endowment for a university and to provide a secure investment for the funds. The first legislature, acting under the advice of the State Superintendent of Public Instruction, John D. Pierce (*q.v.*), passed the enabling act of 1837 under which the Regents, eighteen in all, were to be named and the various departments provided for. Following the Prussian idea, the new institution was distinctly thought of as an integral and crowning part of a state system of public instruction, and it has come more and more to realize this ideal. Three departments were specified: (1) The Department of Literature, Science, and the Arts; (2) The Department of Law; (3) The Department of Medicine. There were also a number of so-called "branches" in different towns, which were fostered by the Regents as tributary to the University; but for lack of funds these had to be left to their own fate after a few years, and in their place sprang up the union or high schools which continued to supply the need. The University was opened for students in 1841, and the first class consisting of eleven members was graduated in 1845. Defects in organization soon became apparent; and the constitution of 1850 reconstituted the governing board, reducing the number to eight, and adding very materially to its powers. The Regents now became a constitutional body and were given absolute control of all moneys received from the interest fund and from fees, without any interference or direction from the state capitol. This feature of the fundamental law, which all subsequent revisions have left unchanged, was at that time unique and is generally believed to have been an important factor in the subsequent prosperity of the institution.

The new constitution directed the Regents to appoint a President who should preside at their meetings (but without a vote) and who should be the principal executive officer of the University. The choice fell upon Henry Philip Tappan, of New York, a graduate of Union College and of Auburn Theological Seminary, a man of wide experience as an educator, and a writer of repute on educational and philosophical subjects. This appointment may be considered the most important single event in the history of the University. During the eleven years of the Tappan administration (1852–1863) the institution was transformed. A nonclassical course was offered, and the degree of Bachelor of Science was first conferred in 1855; courses in engineering were established; the chemical laboratory was built; the astronomical observatory was opened, with Dr. Francis Brünnow as director; graduate study was projected and a beginning made; a department of law was organized (1859). The attendance was quadrupled and became national in character. Names now



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University of Michigan.

appeared on the faculty rolls which were to shed lasting fame on the University — amongst others, Henry S. Frieze, Corydon L. Ford, Thomas M. Cooley, and Andrew D. White. President Haven (1863–1869) carried forward the policies of his predecessor. During this period the courses in engineering were developed under the direction of Professor De Volson Wood (*q.v.*), and the work in English and rhetoric received a marked impulse under Professor Moses Coit Tyler (*q.v.*). Then also Edward Olney began his memorable career at the University as a teacher of pure mathematics. From 1869 to 1871 Professor Henry S. Frieze (*q.v.*) was acting president. These years are noteworthy for two changes which have exerted an important influence upon the educational history of this country: women were admitted to all departments on an equal footing with men (1870); and the so-called diploma or certificate system of admission from approved high schools was instituted.

In 1871 began the long administration of James Burrill Angell, extending over thirty-eight years. During this period the College of Dental Surgery was added, and the same year (1875) the Homœopathic Medical College. In 1876 the School of Pharmacy was organized as a separate department, and the Department of Engineering in 1895. In 1878 the elective system was greatly extended, and a closer relation was established between the University and the public high schools of the country. From this time the institution developed rapidly in many directions. The attendance multiplied, the income steadily increased, the faculties were enlarged; and long before his retirement the institution had taken on an international character. All this had been made possible by the attitude taken toward the University by the state legislature shortly before President Angell's advent. Hitherto the income of the University had been restricted to the interest on the land-grant fund (then yielding something less than forty thousand dollars) supplemented by student fees. The legislature now laid an annual tax of one twentieth of a mill on the taxable property of the State for the aid of the University. This rate has been increased from time to time till the annual income from this source is now something over eight hundred thousand dollars. The annual budget at present (1912) shows an expenditure of about a million and a quarter dollars. The attendance has reached a total of 5582, distributed in every state and territory of the Union and in thirty-three foreign countries.

On President Angell's retirement in 1909, he was succeeded by Harry Burns Hutchins, who had been Dean of the Department of Law since 1895. President Hutchins has been especially active in organizing more closely the alumni of the State, in establishing residence halls for the women students, in securing fellowships for the encouragement of graduate studies and in advancing the standards of the professional schools. I. N. D.

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MICROCEPHALOUS. — Having a small head. Individuals having a head with a circumference less than 42.5 centimeters (17 inches) are counted in this group. With this condition there is associated micrencephalus, or diminished size of brain. Brain weights in microcephalics have been found to be from 200 to 800 grams (normal weight being from 1300 to 1500 grams). All individuals with micrencephalus have only the rudiments of intelligence. S. I. F.

See Craniometry; Cretinism; Defectives.

MIDDENDORF, WILHELM (1793–1853).— German educator, friend and coworker of Froebel (*q.v.*), born in Brechten, Westphalia, and educated at the gymnasium at Dortmund and the University of Berlin, where he studied philosophy under Fichte and theology under Schleiermacher. In 1813 he joined the volunteer corps of Lützow and took part in the War of Liberation. In 1817 he was called by Froebel to Keilhau (*q.v.*), where he remained until his death. He carried on the work of Froebel and did much for the general introduction of the kindergarten. F. M.

MIDDLE AGES, EDUCATION DURING THE. — The educational activities, interests, and institutions of the Middle Ages are treated of under a variety of headings. The foundation elements of this period are considered in the articles on Christian Education in the Early Church; Theological Education, and the various articles on the individual Church Fathers. The articles on Neo-Platonism, Mysticism, and Stoicism treat of the philosophical elements entering as historic factors; the section under Roman Education on the late historic period is also of significance. The actual educational activities of the period, especially as they center around institutions, are presented in the articles on Church Schools; Abbey Schools; Cloister Schools; Convent Schools, and the articles on the various Monastic Orders and education.

See also the article on Teaching Orders of the Roman Catholic Church. Supplementing these are the articles on College; Collegiate Church Schools; Grammar Schools; Bishops' Schools; Chantry Schools; Hospital Schools; Gilds and

EDUCATION. See also the articles on LATIN, GREEK, LOGIC, etc. For the legal side see especially CANON LAW, EDUCATIONAL PROVISIONS IN. The most significant phase of education during the late Middle Ages is discussed under the origin and early work of the UNIVERSITIES. As preliminary to the movement, the article on SCHOLASTICISM AND THE SCHOOLMEN is also of vital importance. The curriculum is dealt with in the article on LIBERAL ARTS; see also the medieval section of the various articles on the subjects of study. Connected with this subject also are the articles on MYSTICISM, NEO-PLATONISM, and REALISM. These topics all deal with education as it is connected with the Christian Church.

There are two other additional phases of education during the Middle Ages of great if not of similar importance. One relates to secular education; that is, of nobles and the ruling classes. This phase of education is presented primarily under the captions CHIVALRIC EDUCATION and GENTRY AND NOBLES, EDUCATION OF. Related to these are numerous articles on the writers of works relating to this education, as Castiglioni, Peacham, etc. See also the articles on MANNERS AND MORALS, EDUCATION IN, and on SOCIAL REALISM. The third phase of education is that relating to the common people. Here there is little organized effort and few institutions. But the fundamental aspect of the education of the great masses is discussed under APPRENTICESHIP AND EDUCATION. Related to this are the discussions of the POOR LAW AND EDUCATION, and GILDS AND EDUCATION. The following discussion will relate only to the general conditions of the Middle Ages. In this connection read also the articles on the RENAISSANCE, EDUCATION DURING THE, and REFORMATION AND EDUCATION, for tendencies at the close of the Middle Ages.

General Characteristics. — Both the matter and the manner of education in the Middle Ages have been commonly conceived as something *sui generis*, a product, and a not very important product, of the Middle Ages themselves. Medieval education has been represented as different alike in source, subject, and scope from the education of ancient times which preceded it and that of modern times which followed it. Medieval education has been supposed to be separated from that of ancient times by the deluges of the coming of Christianity and the barbarian invasions, and from that of modern times by the hiatus of humanism and the Reformation. In fact, education in the Middle Ages was carried on without a break from the heathen and ancient world and continued without a break into the humanistic and modern world. The educational institutions of the Middle Ages were the direct offspring of the educational institutions of Greece and Rome and the direct parents of those of England, Germany, and America. The very stuff of which education was woven, a study of the language and literature of Rome, and at intervals of those of Greece, was practically identical from the days of Cicero, we may almost say of Demosthenes, to the days of Gregory the Great, and from the days of Gregory the Great to those of Thomas à Becket, of Luther and Cranmer, and since then to the days of the younger Pitt and Washington, of Bismarck and Gladstone. Or, looking not at the educated, but the educators, we find a continuous line from Chrysippus to Quintilian, from Quintilian to St. Augustine, from St. Augustine to William Wayneflete and Thomas Wolsey, from them to Thomas Arnold (*qq.v.*). There has been indeed a greater change in the subjects of education since 1850 than there was during the whole period from 450 B.C. to A.D. 1850. But there is one important difference between the education given in the years from A.D. 450 to A.D. 1450 which marks that millennium off as a separate epoch in the history of education and distinguishes it emphatically from the periods which precede and follow it, and may almost be taken as defining the era of the Middle Ages itself. This difference lies not in the institutions, in the subject, nor in the method of education, but in its object. Till the middle of the fifth century the object of education was to fit a man to be a good citizen and a successful man of the world. From the middle of the fifteenth century the same object began to be put forward, and from the middle of the sixteenth century became the accepted object of education. But in the thousand years between education had a different object. The main object of education was no longer to prepare a man for this world, but for the next; no longer to make him a good citizen or to be successful in this life, but to be a good Christian and to attain successfully the world to come. For patriotism, was substituted religion; for the promotion of society, the saving of a man's own soul. The whole of education was dominated by the Day of Judgment and the dread of the world to come, and the necessity of the appeasement of the Judge by self-abasement and self-torture, by constant prayer and assiduous asceticism. The Stoic philosopher and the Essene met together and, reincarnated as monk, conquered the world. (See MONASTIC EDUCATION for related articles.)

Fusion of Christian and Roman Education. — It was not merely the coming of Christianity which produced this change. The early Christians (see CHRISTIAN EDUCATION IN THE EARLY CHURCH) took the schools as they found them. They used the public grammar schools and rhetoric schools as they had come down from the unendowed schools of Athens and Alexandria. Quintilian, *c.* 91, marked a transition from the old to the new style, from the voluntary fee-paying school to the endowed free school. At the beginning of the third century after Christ, Alexander Severus had made endowed schools general; the Christian Emperor Constantine, in 321, extended the privileges of the masters and set an example for the medieval clerks by exempting them from military and municipal service; and the anti-Christian Emperor Julian, in 362, also anticipating the royal prerogative in the matter of clerical appointments, made the appointment of masters by municipalities subject to imperial confirmation. (See GRAMMAR SCHOOL.) The Christian Gratian in 376 settled a universal and high scale of salaries for the various masters of Latin and Greek grammar and of rhetoric. It is noticeable that even then Greek was becoming a rarity in the schools of the West as the appointment of a Greek master at the then capital Trier or Treves was conditional "if a fit one can be gotten." It may be remembered that St. Augustine, who was born in 354 and was therefore at school in the decade before Gratian's edict, was taught Greek, but hated it and never mastered it. He himself kept a rhetoric school first at Carthage and then at Milan, when he became a Christian and then a bishop. Sidonius Apollinaris, born in 431, was educated at Lyons Grammar School with Avitus, who rose to be for a short time Emperor, and himself, after being Prefect of Rome, became a bishop and a saint. In 483 he wrote a poetical epistle to the rhetoric schoolmaster at Perigueux, and a letter to his son, when following him at the grammar school at Lyons, warns him much as a modern father might against loose talk, and encourages him to take an interest in his Vergil and Homer.

In Italy the schools continued in spite of the barbarian conquests, for the Goths were Christians. Theodoric's own grandson was sent to a grammar school and flogged in the usual way till the nobles (*c.* 525) protested against his spirit being broken and demanded that he should be trained in the use of arms instead. Gregory the Great (*q.v.*) is said to have learned grammar, rhetoric, and logic in the schools of Rome. But his works contain small traces of classical culture, and he was perhaps the last man of eminence to be brought up in the old way. In Gaul the public schools of grammar and rhetoric had meanwhile disappeared, though it is impossible to fix the exact moment of their disappearance, and so far as schools existed at all they were maintained by the bishops. They had fallen like the municipalities which controlled them, under ecclesiastical control.

Monasticism and Learning and the Early Middle Ages. — It is clear that the monastic spirit was gradually invading the Western church as it had already done the Eastern, and tending to displace the study of classical literature. The fifth century witnessed the rise of a school of Christian poets, who endeavored to substitute the Jewish and Christian mythology in literature for the pagan. The first attempt in this line seems to have been made by a lady, Proba Valeria Fullonia, wife of a proconsul in Gaul at the end of the fourth century with *Centones Vergiliani*, which consisted of lines of Vergil wrested from their context and rearranged so as to make a patchwork life of Christ. Earlier, Sedulius, about 450, master or past master of a rhetoric school in Italy, wrote a work in better taste, called *Carmen Paschale*, probably in parody of Horace's *Carmen Seculare*, in which the life and death of Christ is made the subject of a long poem in Latin hexameters on the Vergilian model. He was followed by a whole school of authors, chief among whom was Aurelius Clement Prudentius (*q.v.*), a rhetoric master and lawyer at Rome, who has been called the Christian Pindar. In a wonderful variety of meters, his daily hymns, *Liber Cathemerikon*, and his *Psychomachia*, or *Battle of the Soul* between virtues and vices, were published in 409. We have evidence that they were a favorite schoolbook in the fifth, the tenth, and the fifteenth centuries. Juvencus (*q.v.*), another rhetoric schoolmaster in his *Historia Evangelica*, turned the Gospels into Vergilian hexameters, and Dracontius, pupil of the grammar schoolmaster Felicianus "who restored letters to Carthage," wrote hexameters, *De Laudibus Dei*, between 484 and 496. All these poets write with a more or less conscious desire to supersede their classical but pagan models as schoolbooks, and Pope Gelasius, in 496, specially commended Sedulius for this purpose. Perhaps it was the use of the original Vergil instead of these new poets which drew down on the devoted head of Bishop Desiderius of Vienne in 597 the fierce rebuke of Gregory the Great. "We cannot relate without shame that it has come to our household that your brotherhood teaches grammar . . . since the praise of Christ cannot lie in one mouth with the praise of Jupiter. Consider yourself what a crime it is for bishops to recite what would be improper in a religiously minded layman." We cannot doubt that what Gregory had in his mind was the line in Vergil's *Eclogues*, always a favorite schoolbook, *Ab Jove principium, Musæ, Jovis omnia plena*, and the loves of Corydon and Alexis. We must remember that Gregory was the first monk to become Pope, and it shows how even in a nobleman of Rome, ex-prefect and imperial official though he was, the monastic spirit was tending to destroy culture and the classics. We do not know whether Didier answered this missive, but he had an answer ready to his hand in Augustine "On Christian Teaching" (ii. 39–42), who laid down that all branches of heathen learning, while containing much superstition, "contain also liberal instruction adapted to the use of the truth" and cites Lactantius, Cyprian, and other

Fathers who were "laden with the spirit of the heathen," while Moses himself was "learned in all the wisdom of the Egyptians." The reasoned defense of learning not only of grammar, but rhetoric and even logic, contained in this work of Augustine, written in 427, was one of the main influences which prevented the monastic furore, which attacked schools as it attacked marriage and other institutions, from converting the Dark Ages into absolute blackness. But it was into the hands of bishops and not of monks that the rule and government of cities and of schools had fallen. But Gregory of Tours (*q.v.*) shows that not all the bishops themselves had the learning of Didier of Vienne. He had learned to read at the age of eight, but he was taught by reading not the classics, but the Scriptures, and never learned grammar properly, though his teacher was Avitus, Bishop of Clermont. In later days at Tours, with the advent of Venantius Fortunatus perhaps, who had "sipped the ills of grammar and drunk the deep pools of rhetoric in Italy," he read, whether in an anthology or otherwise, Vergil, his quotations from which, dragged in and unassimilated, "lie like lumps of marl upon a barren moor." The growing asceticism shows itself in the necessity under which Venantius, a litterateur born if ever there was one, found it necessary to write a labored *Life of St. Martin* in hexameters, and Gregory of Tours, a born historian, had to supplement his invaluable *History of the Franks* by the *Glory of Confessors* of the faith. M. Paul Roger has set himself to show that all the reputed educated men of the succeeding generations, 590 to 650, had received no more instruction than that of learning Latin in and by and for the sole purpose of understanding the Scriptures, and certain it is that the lives of the saints, which afford our sole knowledge of these schools, speak almost invariably of their being instructed in sacred letters (*sacris litteris*) or divine learning (*divinis disciplinis*). General education and, by consequence, general learning had died out in Gaul. In Spain, on the other hand, where the controversy between Arians and Catholics still prevailed, learning was kept alive. King Sigebert, to whom Isidore of Seville had dedicated his *De natura rerum*, which remained one of the great works of the Middle Ages, was himself partly learned, *scientia litterarum ex parte imbutus*. Isidore, brother of the Archbishop of Seville, was the most learned man of the age. He forbids, indeed, monks to cultivate learning. "A monk should eschew reading gentile works or the writings of heretics; for it is better to remain in ignorance of their pernicious teachings than by trying thus to run the risk of flying into the snare of error." But he does not apply his prohibition to the clergy who lived in the world and had to preach. "Ignorance is the mother of error and the nurse of vice." "Better grammar than heresy." His *Etymologies*, the great encyclopedia of the Middle Ages in twenty books, is full of quotations from classical authors, and though there is some reason to think that it was intended to supersede the dangerous necessity of referring to the originals, it did, in fact, materially tend to prevent their being altogether barred. In science it proved to be a last flicker of the torch. It was, however, to England that the credit is due of preserving learning from complete extinction by a system of education. If Bede (*q.v.*), who, it is true, wrote a century after the event, is to be trusted, in 631 there were still grammar schools in Gaul and in Kent, which served as a model for the rest of England. Sigebert, king of the East Angles, was converted to Christianity when an exile in Gaul. Wishing to imitate what he had seen well done there, he set up a school in which boys should be taught letters (*litteris erudirentur*), and when this word is used without qualification it must be taken to mean, unless the context otherwise requires, grammar; that is, learning Latin by reading Latin authors, and probably classical authors. Sigebert did not, however, find it necessary to import his schoolmasters direct from Gaul, but with the assistance of Felix, a Burgundian, then living in Kent, whom he made bishop of his kingdom, he gave them masters and ushers after the fashion of Canterbury (or Kentish) custom. As the date is only thirty years after Augustine's settlement at Canterbury, it is to be inferred that both at Canterbury and later at Rochester, when a bishopric was created there, the first archbishop had instituted grammar schools. A generation later by a fortunate accident there came to England the Greek archbishop Theodore, who, though then a monk at Rome, had been born at Tarsus in Cilicia, and, presumably before he became monk, had been well instructed both in secular and divine letters, Greek as well as Latin. Accompanied by the African, Adrian (*q.v.*), who was in a monastery near Naples, and, therefore, also knew Greek as well as Latin, they went all over England, not only preaching, but teaching. The Romans of the day despised Greek. Gregory, though he was Papal nuncio in Constantinople for five years, never took the trouble to learn Greek; it is fair to say that he was a monk at the time. But the English, being still new alike to Christianity and to education, had no such views. To them Greek, like Latin, came with all the glamor of the ancient civilization, and there was no danger of their worshiping Zeus or Venus, because they read Homer or Ovid, as was the case with the lingering paganism of Italy or even Gaul. So Theodore and Adrian taught not only the way to read the Scriptures, but the art of meter and astronomy and profane (*secularibus*) literature. Hence it was that whether the grammar schools instituted by Augustine taught the classics or not, the grammar schools as reformed by Theodore certainly did. Hence it came about that the monastery at Jarrow was redeemed from being a mere abode of English-speaking monks and became the home of Bede and of learning; that Winifred and Willibrod handed on to Germany and Holland, not merely Christianity, but schools in which a classical education was given; and that Alcuin gave back to France all and more than all that France and Italy had given to England through Augustine.

It was not that there was any mysterious virtue in the mere learning of Greek, as some writers on the Renaissance or on modern education appear to think. The knowledge of Greek did not prevent the Eastern Empire from sinking even lower than the Western. It was that the mere fact of bilingual study appears to have a sharpening effect on the intelligence as appears in the superior acuteness of the Welsh to the English schoolboy; and this mere fact of opening up another literature enlarged the horizon of thought and the breadth of mind. Though the study of Greek died down again in the third generation, after Bede, especially in the north, there is reason to think that it lingered on in Kent and Wessex till the Danish invasions began again after Athelstan. The outbreak of English culture, which followed Alfred's reconquest of the south, and the place given to English in Alfred's scheme of education may be largely due to the competition of the second learned language, which made him realize that all learning was not necessarily shut up within the walls of the Latin language, and that as the Greeks prayed and taught in their own tongue, so might the English. It is clear from Alcuin's account of the school at York as taught by Archbishop Albert and himself that the old distinction between the grammar school and the rhetoric school had disappeared. Not that rhetoric itself or logic ceased to be cultivated. But as in the days of Quintilian the grammar school, as he conceived it, limited to teaching grammar and expounding the poets, was trenching on the sphere of the rhetoric school by reading also the historians and teaching the elements of oratory; now that the school was not preparing citizens for the forum, but clerks for the church, rhetoric fell into a secondary place, and, though the art of speaking was still useful for a preacher, it became relegated to a comparatively unimportant position in the school, which, if given a single name, would have been the grammar school. In the same way a modicum of mathematics, only enough to fix the calendar and find the right time for Easter, was taught and a little law, whereas the law schools at Rome and Berytus had been great and separately endowed.

At a Synod in Bavaria in 774 it was ordered that every bishop should establish a school at his see with a learned master to teach according to the tradition of the Romans. The Synod of Aachen in 789 under Alcuinian influences ordered that not only every bishop's see, but also every monastery, should have schools of readers as well as singers and of writers of correct Mss. But the monastic schools were closed again by the Synod of Aachen in 817. From that time education for others than the monks in the monasteries was exclusively a matter of concern to the secular clergy. Efforts were made from time to time to extend it to the laity, also. From Alcuin's words it would appear that every noble child could be educated in York School, and a letter of Alcuin's shows that Charlemagne tried to effect the same, while Alfred the Great (according to Asser, who, it must be remembered, is probably an eleventh-century compiler) made his earls, thanes, and bailiffs learn grammar, and Alfred himself, in his *Preface* to Gregory's *Pastoral Care*, definitely set up as his ideal that every English freeman should learn at least to read English, and those who wished should go on to Latin. (See ALFRED, KING.) The Council of Cloveshoo in 747 had indeed expressed a pious wish in this direction, also. But the last invasions of the Northmen in the tenth century, destroying churches and schools wholesale as well as the towns in which they were, wiped out any idea of lay education except in the highest classes and threw back the whole of North Germany, France, and England. The Alcuinian tradition was practically extinguished. Until the conquest of England was finally accomplished by William the Conqueror, learning was at a discount outside Italy.

The Late Middle Ages. — In the seventh and eighth centuries Italy had sunk perhaps lower into ignorance, owing to the monastic and anti-classical influence of Gregory the Great and to the Lombard and other invasions in the North or West of Europe. Gregory had indeed instituted a song school at Rome to teach the Gregorian chant, which may or may not have been an advance on the Ambrosian chant, but was certainly merely ecclesiastical, and contributed not at all to learning except in so far as learning psalms and hymns implied some knowledge of reading, though not necessarily an understanding of Latin. Tested by charters, and it was almost exclusively for composition of legal and diplomatic documents that Latin was still kept up at all, the Latin of Italy was hopelessly barbarous; whereas English charters of the same date, though turgid and involved, are grammatical and fairly good legal Latin.

The Song School. — One wonders whether the schoolmasters (*magistri scolarum*) who signed charters at Milan in 748 and 767 were as one who signed in 809 expressly described himself master, of the song school. It was perhaps from Gregory's song school that the crowds of scholars came, who are recorded as greeting Charlemagne on his triumphal entry into Rome in 774. At all events, the first educational act noted of Charlemagne is the introduction of Roman song schoolmasters into the schools of Gaul, and in a subsequent quarrel between the foreign and the native singers in 787 he decided in favor of the Romans because Rome was the *fons et origo* of the art. It was only on his second journey to Rome that he is said to have brought back grammar masters, and that in the person of Alcuin the Englishman, not of a Roman. Song schools were recorded as having been established in England at York by Paulinus, in which the art as taught in Kent was practiced, an implication of previous establishment by Augustine at Canterbury, from whence Paulinus brought his song schoolmaster, James the Deacon. Gregory may therefore claim the educational merit, at all events, of establishing the song school as even a more necessary part of medieval education than the grammar school. In all the cathedrals and collegiate churches from the beginning of the seventh century, the song school stood as one of the essential parts of medieval education, not because it softened manners and did not allow them to be brutal, but on the purely utilitarian ground that it was necessary for the church services. Hence the song school extended itself to the parish churches. As it was essential for singing that the choristers should be able to read, the song schools became the elementary schools of the Middle Ages. In the inevitable tendency of the elementary schoolmaster to encroach on the domain of the higher education, we find in the thirteenth and succeeding centuries disputes between the song schoolmasters and the grammar schoolmasters, where both existed, as to whether and how far the song schoolmaster might teach the elements of grammar. It was generally, but not always, settled in favor of the song schoolmaster being allowed to teach the " Donat," or accidence. In some cases, especially after the Black Death in the fourteenth century, we find in some smaller places like Northallerton and Howden in Yorkshire the two schools rolled into one, and one master teaching both grammar and song. In the greater places and churches the two were always distinct and were, under different officials of the chapter, the precentor being responsible for the song school and the chancellor for the grammar school. The song school was specially, though not necessarily, confined to churches. The grammar school was specially for clerks and laymen, though choristers were not excluded, and in some cases were made to attend. But their attendance was always a difficulty. So at Lincoln and Salisbury, where in the fourteenth and fifteenth centuries separate grammar schools were established for the choristers, growing gradually out of private tutors appointed to look after them, the grammar school was at first under the precentor, but was recognized as subsidiary and subordinate to the old, the city or Cathedral Grammar School, under the Chancellor. At Lincoln, after a quarrel with the town council on the subject, it was definitely settled in 1406 that the choristers' grammar school should be allowed, but should not take in any other than choristers or relations of the canons living in their houses; and once a term all the scholars in it were to go down into the town and attend the ancient grammar school and sit there under the teaching and discipline of the grammar school master in token of its superiority. But the song school received separate treatment.

Conditions in Italy. — The Carolingian revival affected Italy as it had France. In 825 an important educational edict was published by the Emperor Lothaire assigning Pavia, Turin, Cremona, Piacenza, Florence, and four other places for central schools to which scholars from surrounding districts, mentioned in detail, were to resort. The exact meaning of this edict has been disputed between Protestant and Catholic historians. It begins by a statement that " as to teaching (*doctrina*), which through the carelessness and laziness of certain rulers is everywhere wholly extinct, it had been decreed that the greatest care shall be taken by those who are assigned by us to teach others in certain places named that their scholars shall become proficient." Giesebrecht and Roger argue that this only refers to religious teaching, to theology, and not to literary or classical instruction. Ozanam applies it to the latter. The unqualified words *doctrina* and *scolastica* point to the latter. Even if, however, the schools were only theological, they imply a preliminary grammar training for those who were to take the Scripture course. The next year, 826, saw the often-quoted conciliar decree of Eugenius II which, complaining that in some places neither masters nor a cure are found for the study of letters (or a grammar school), directs that, in all bishops' sees and in other places where necessary, masters and doctors should be established with schools of grammar and the liberal arts. This is surely merely translating into ecclesiastical law and explaining Lothaire's decree of the year before. It only lays down what was already the practice certainly north of the Alps, though it may have been new south of them. In 853 a constitution of Pope Leo IV says that even if teachers of the liberal arts are rarely found, nevertheless masters of theology and teachers of the ecclesiastical office shall by no means be wanting. In southern Italy, at Naples, Duke Sergius is said to have known both Greek and Latin and to have had his two sons, the elder intended for a soldier as *magister militum* and the younger Athanasius intended for a bishop, educated in both languages. As Bishop of Naples he is said to have founded schools both of grammar and song. The Bishop of Modena, in appointing an archpriest in 908, puts first of his duties that of keeping a school and educating boys. It was in connection, however, chiefly with the two studies of medicine and law which, though largely, if not exclusively, practiced, at all events in the North, by clerks, in Italy appear to have remained or to have been largely practiced by laymen, and so did not wholly fall under the deadening influence of an exclusively "other-worldly" attitude, that a revival led by Italians began. At Salerno, which was in the Greek-speaking part of Italy, and long retained a connection with the Eastern Empire, the study of medical authors was kept up, and therewith was kept up a knowledge of Latin for other than religious purposes. (See UNIVERSITIES.)

The Rise of Universities. — To Salerno is due the first known gathering of doctors or teachers which is entitled to be called a university, and the fame of which it can hardly be doubted was influential in aiding the establishment of similar gatherings at Bologna in law and at Paris in theology.

Similarly as regards law. In spite of the barbarian invasions, there seemed always to have been some tincture of Roman law in the cities of Italy. Gregory the Great was essentially a lawyer. Alcuin records that law was taught among the other items of the encyclopedia in the school of York by his master, Archbishop Albert, in 736 (*Illos juridica curavit cote polire*). After the Lombard invasions in Italy it almost disappeared save at Ravenna, where the connection with the Eastern Empire kept it up and whence it first spread on the revival. The term *scholasticus* for a teacher is probably due to Ravenna. In the days of Gregory the Great a *scholasticus* was not a teacher or a scholar, but a high imperial official, a lord high chancellor, if not a chief justice. But by the tenth century *scholasticus* is used at Ravenna as equivalent with *magister*, to mean what a little later was called a doctor of law,— not so much a teacher of law, but an expounder of it as an advocate, one who lays down the law, — and apparently, as in the case of Portia in the *Merchant of Venice*, the advocates were almost regarded and frequently consulted, if not as judges, at least as *amici curiæ*.

It was at Paris that Lanfranc (*q.v.*) was born. Lanfranc, like Anselm, coming from Italy, infused a much more secular and rhetorical spirit into the studies of France, and so contributed to the awakening which showed itself in Italy in the union of the Law Schools or University of Bologna and in France which became the University of Paris, at the end of the eleventh century. Both Lanfranc and Anselm, when they became monks and then archbishops, were potent instruments of reaction, and their influence largely contributed to the conversion of the nascent University of Paris from a school of free discussion and unfettered philosophy, into an almost entirely theological seminary in which logic and philosophy were only studied as a preparation for theology. The free thinkers Berengarius, Roscelinus, Abélard, were crushed one after another. The brilliant anticipation of the Renaissance which produced such scholars and researchers as John of Salisbury, Walter Map, Giraldus Cambrensis, faded away.

The mental gymnastic of dialectic, better perhaps than any other for sharpening the intellect, remained and proved an immense gain to the medieval mind. Its practice at least showed that there were two sides to every question, and it cultivated the habit of argument and to some extent of investigation. It elevated the medieval schools into something more approaching the rhetoric schools of the ancient world. It must never be forgotten that what is spoken of with scorn by later writers as the scholastic system is really nothing more than the system of discussion and argument conducted with a view to and by way of *viva voce* debate, instead of as now on paper. Hence it was keener, closer, and at the same time produced greater heat than our modern discussions by newspapers, magazines, and books. It must be remembered that the same system which produced Anselm and Becket, produced also Wycliffe and Luther.

Church Schools. — The rise of the Universities produced an exhilarating effect on schools in general, if it had the effect of depressing others. There was now no question as in the Carolingian days of an Imperial edict being required to establish three public schools for the whole empire, or of a Papal bull to require every bishop to provide for schools in his episcopal city. In the tenth-century development collegiate churches had spread schools to all the towns considered of sufficient importance to have such institutions. In all the boroughs recorded as built by Edward the Elder, and Ethelfleda, or Athelstan, and which survived to post-Conquest times, there are found, when records begin, collegiate churches with grammar schools attached, such as Bedford, Beverley, Derby, Leicester, Oxford, Stafford, Warwick — it is inferred that they were constituted when the towns were castellated or fortified. Foreign examples confirm this. Not only were the collegiates of Nesles and Poitiers famous for their schools, but in Germany and France collegiate churches were multiplied in the same town, and each of them had its school. At Liège, besides the cathedral school of St. Lambert's, there was a school at the collegiate church of the Holy Cross, which proved a model as well as probably gave its name to Harold's foundation at Waltham Holy Cross, at St. Martin's, at St. John's, with which last, in about 1090, there was a fierce struggle for precedence between the rival schoolmasters, which the chapter of the cathedral was called in to settle. So at Cologne, besides the cathedral school there were in the eleventh century the schools of the collegiate churches of St. Cunibert and St. Gereon. Before the end of the fifteenth century there were no less than eighteen grammar schools in the various collegiate churches and hospitals in that city. The fact that there was an independent collegiate church of St. Geneviève in Paris which had a right to keep a school independently of the license of the Chancellor of Notre Dame, had an important influence in the development of Paris University.

In England, whether through less populousness and wealth or for what other reason is not clear, there was no multiplication of collegiate church schools (*q.v.*) outside London. But in every town of any size there was a collegiate church, or a collegiating as in Hull and Northampton of the chantry priests attached to the various churches; and in York and some other places there were rival schools. In the smaller towns and country parishes the schools were supplied by chantry (*q.v.*) foundations, in which the priest, either by foundation or of his own will to earn money and obtain occupation, kept school. The gilds, too, set up or helped to endow the schools, as in the famous case of Stratford-on-Avon grammar school. The supply of schools indeed was ample and tended more and more as time went on even to outstrip the population. In the foundation of University colleges begun at Paris and imitated within a few years at Salisbury, Oxford, and Cambridge, Bologna, in the thirteenth century gave an enormous impetus to the foundation of collegiate churches, chantries, and hospitals. Every one who rose to rank or wealth in the church, especially in the civil service, felt almost bound to found or augment the church or hospital or chantry of his native place, and therewith his school. The latest phase of this development was when William of Wykeham founded a school as itself a collegiate church at Winchester and was imitated by Henry VI at Eton and a host of others.

Transition to the Renaissance. — But as long as the monastic spirit prevailed, and extended to an enforced celibacy of the clergy, education and learning seemed doomed to sterility. There were always a few bold spirits who, like the biographer of Adalbert, Archbishop of Mainz, complained that though philosophy shone in his city and the school flourished, it would be more learned if the keeping of choir did not a hateful evil and the rigor of the church put impediments in the way of learning, for psalm singing and learning don't agree. But the prevailing view was that enforced by Bishop John Grandison of Exeter, in 1357, who complained that the schoolmasters in his diocese took the boys away from reading matins and the hours of the Virgin and, more like gentiles than Christians, hurried them to other schoolbooks, the poets and others. What more than anything else, however, retarded the progress of learning and the world in general was the asceticism which in the twelfth century finally overcame the freedom of the clergy to marry. Multiply clerks as they might, their learning perished with them, and it was impossible for a learned or literary class to grow up when each successive generation had to start anew from the scions of the unlearned. Consequently there was little advance made until in the Renaissance the layfolks, beginning with the aristocracy of Italy, followed not long behind by those of other nations, as the example of Henry VI (*q.v.*) shows, betook themselves to learning. Through them only do we get such a foundation deed as that of Bingham asking leave of Henry VI in 1439 to found a college to train grammar school masters; no longer, in the words of Wykeham, because grammar was the gate of science leading to the mistress of all learning, — theology, — but because it led to a knowledge of the laws and promoted intercourse between nations. When a parson and a scholar could plead for learning in these terms and for this object, the Middle Ages were over and the Renaissance and the modern era of education had begun.

A. F. L.

References: —

See the reference lists to the various articles to which cross reference is made in the text.

MIDDLE SCHOOLS. — See MITTELSCHULE.

MIDDLEBURY COLLEGE, MIDDLEBURY, VT. — A nonsectarian institution, chartered 1800. The incorporators were mostly Congregationalists of Yale antecedents, but the college has never had any formal ecclesiastical connection. Fellows are chosen for life, and elect their own successors without restrictions. The charter has never been amended. The first president was Rev. Jeremiah Atwater (Yale, 1793), who previously was principal of the Addison County Grammar School, founded on the advice of President Dwight as a forerunner to the college. The first class was graduated in 1802, at which time the first academic degrees conferred in Vermont were bestowed. For ten years the work of the college was done in a frame building, which it shared with the grammar school, but in 1810 Seth Storrs presented a campus, thirty acres on an eminence on the edge of the village. Here the first building was erected in 1815, and later named Painter Hall, in honor of Gamaliel Painter, a founder and benefactor. This building, which is still in use, is one of the best examples of early collegiate architecture. A large chapel and recitation building were erected in 1836, and Starr Hall, a dormitory, in 1861. The growth of the college was steady under Presidents Davis (1809–1817) and Bates (1818–1839), but was retarded during the able administration of Benjamin Labaree (1840–1866) by dissensions over the slavery question and various religious issues. The Civil War nearly emptied the college of students, and the institution was slow in recovering. President Cyrus Hamlin (1880–1885), founder of Robert College, proved a vigorous administrator. Under Ezra Brainerd (1885–1908) substantial endowments were received. In 1883 women were admitted, and since 1895 their number has approached that of the men. Since 1888 $2400 a year has been received from the state for scholarships for thirty Vermont students. The centennial of the college was celebrated in 1900. In 1911 a fund of $200,000, one half for endowment, which was initiated by a conditional offer of $50,000 from the General Education Board (*q.v.*), was completed. The Vermont legislature of 1908 established a department of pedagogy for the training of high school teachers by an annual appropriation of $6000, which was increased in 1910 to $13,600. The income in 1911 was $59,113.30. The resources are (1911): permanent funds, $499,672.64; annuity funds, $36,500; plant, $335,987.37; reserved for buildings, $45,961.51; total, $917,154.56. The college offers classical, scientific, and pedagogical courses, and confers the degrees of A.B., B.S., and A.M. in course. The faculty (1911) numbers twenty-six, of whom nine are full professors. The present enrollment is 408, or, excluding the summer session, 305. The attendance doubled in the six years preceding 1911. The college was on the first list of accepted institutions of the Carnegie Foundation (*q.v.*). J. M. T.

Reference: —

A Record of the Centennial Anniversary of Middlebury College. (Middlebury, Vt., 1901.)

MIDLAND COLLEGE, ATCHISON, KAN. — A coeducational institution founded in 1887 by the General Synod of the Evangelical Lutheran Church. Academic, collegiate, and music departments are maintained. Fifteen units are required for regular entrance to college. Degrees (A.B., B.S., B.L.) are conferred on completion of the appropriate courses. The enrollment in 1911–1912 was 145. The faculty consists of fifteen members.

MIÉGE, GUY (1644–1718). — He was educated at Lausanne, and about 1658 became an "academist." He came to London in 1660. After traveling for a time in Europe, Miége again appears in London in 1678 as a teacher of French and geography. In 1678 Miége published his *New French Grammar, or a New Method for Learning of the French Tongue*, consisting of vocabularies and dialogues, mainly "discourses of cosmography" in French. This work he describes as a new method for learning French. The *Grounds of the French Tongue* (1687) covered the same field, but omitted the geographical discourse. The teacher of French (1) must speak true French; (2) should have good learning; (3) should have good skill in the English language, "because without it it is impossible he can teach by the grammar"; (4) should be thoroughly acquainted with the textbook he uses. In 1677 was issued a *New Dictionary, French and English, with another, English and French*, in which he acknowledges his indebtedness to the *Dictionary Royall French and Latin* of the Jesuit Father, Pomey. (See INDICULUS UNIVERSALIS.) He introduces here derivatives in their alphabetical order, but with reference to the primitives. This work was followed in 1688 by a much larger one, the *Great French Dictionary.*

Miége names Cardinal Richelieu's establishment of an academy as a ground for the need of a new dictionary, for the Academy had driven from the French "excrescences" and "irregularities," and these remained in even the best of the current French-English dictionaries. He quotes Howell (*q.v.*) as saying that the English language is so made up of the French that he needs to study French if only to speak good English.

Other educational works of Miége were: (1) for the teaching of French: *A Dictionary of Barbarous French* (taken from Cotgrave's Dictionary, 1679), *A Short Dictionary English-French and French-English* (London, 1685), *Nouvelle Méthode pour apprendre l'Anglais* (London, 1685), *Nouvelle Nomenclature Française et Anglaise* (London, 1685); (2) in Geography: *A New Cosmography or Survey of the Whole World* (London, 1682); and (3) for teaching English, a textbook: *The English Grammar*, 1688, as to which Miége seems to have agreed to a division of labor, himself instructing French people in English, and Abel Boyer instructing the English in French. F. W.

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MILAN, ROYAL FACULTY OF LETTERS AND PHILOSOPHY, ITALY. — See ITALY, EDUCATION IN.

MILDE, VINCENZ EDUARD (1777–1853). — One of the most prominent Austrian educators; was born at Brünn, Moravia, and received his early education at the gymnasium of his native city. In Vienna he studied theology, and, in 1800, he began his activity as a parish priest. From 1802 to 1804 he directed the religious instruction in several Vienna schools, in 1805 he was made court preacher, and in 1806 he received the chair of pedagogy in the university of Vienna. For the use of his students he published his *Lehrbuch der allgemeinen Erziehungskunde* (*Textbook of General Pedagogy*, 1811–1813), which was based chiefly on the principles of Kant and Pestalozzi. In 1823 he was made Bishop of Leitmeritz, and in 1831 Archbishop of Vienna. In both positions he did much for the cause of popular education and for the training of priests and teachers. In his will he directed that the whole income of his estate be used for the support of poor priests and schoolmasters. F. M.

MILITARY ACADEMY. — See Military Education.

MILITARY EDUCATION. — **Prussia.** — In recent times the Prussians were the first to develop a comprehensive scheme of military education. Under the strong influence of their disasters in 1806 they went to work with brilliant leaders in a reform of the entire military system, which they developed in comparative quiet until the three wars which they fought between 1864 and 1870 showed their preëminent position as a military nation. Since then the world has become their willing pupil, and all great modern armies have taken their lead. Those who have not done so owe their neglect to political and other conditions which their military advisers do not cease to regret. The method followed by Germany is, therefore, a standard, and the others are either repetitions or more or less successful adaptations of that system.

In Prussia the control of so much of the military education as is not connected with service with troops is, with one exception, vested in a single officer, the Inspector-General of Military Education and Training. The exception is the War Academy, which, being a staff college, is under the supervision of the Chief of Staff of the army. The Inspector-General is assisted by two permanent boards, (*a*) the Board of Studies, in matters connected with the general system of instruction, and (*b*) the Supreme Examination Board, in regard to examinations and qualifications for commissions. The system of education is still further centralized by placing all cadet schools under command of a major-general, the war schools under a lieutenant-general, and the infantry schools under a major-general. At the same time each of the institutions has a board of studies, which is charged with the general control of the course of study and with the duty of making suggestions for its improvement. It is noticeable that a large proportion of the instruction is in the hands of civilians, who also have a certain proportion of places on those boards.

The entire system of military schools may be divided into four groups. (*A*) Schools for the preparation of candidates to reach the grade of officer. (*B*) Schools for the completion and improvement of the education of commissioned officers. (*C*) Schools for noncommissioned officers and men. (*D*) Schools in the duties of officers belonging to special services and other noncombatant arms.

A. The Schools for the Preparation of Candidates for the Officers' Commission are of two kinds, (*a*) Cadet schools (*Kadettenhaüser*) which prepare for the ensign examination. They are of two grades, senior and junior. The course of studies covers nine classes. The term is one year for each class. The course is assimilated to that of the royal schools and gymnasia, or public schools of the country, and graduation in the upper first class is a qualification for admission to a university. The cadets are under military instruction and discipline, but purely military subjects have no place in the curriculum.

The cadets are also divided into four classes called conduct classes. On entering they are assigned to the third class. They are promoted into the second class for good conduct and into the first class for exceptionally good conduct. The higher conduct classes enjoy special privileges and favors, especially in the matter of liberty. The fourth or lowest class is a disciplinary section. Cadets who pass into this section are under close supervision, and enjoy no privileges or liberty.

The junior cadet schools are eight in number, and are located at Goslin, Potsdam, Wahlstadt, Bensburg, Plön, Oranienstein, Karlsruhe, and Naumburg. The total capacity of these schools is about 1700 cadets. The members of the corps are largely sons of army and navy officers, and receive subsistence, clothing, and tuition either free or at a nominal charge. Although intended for military service, there is nothing compulsory about the institutions. Admission is subject to a qualifying examination in elementary subjects. Entrance may be obtained at the age of ten years. The average number of hours spent in classroom is twenty-eight hours per week.

The junior schools keep the cadets through the first five classes, and transfer them to the senior cadet school at Gross Lichterfelde, when they have successfully completed the course of the upper third class. Thus, under normal conditions, they would enter the senior cadet school at the age of fifteen years, and would finally graduate at nineteen years. There are 1000 cadets at Gross Lichterfelde, and they spend thirty hours per week in class.

Service in the Ranks. — Normally the next stage in the progress of the cadet after passing through the cadet schools is to take the ensign's examination and to serve as a noncommissioned officer for six months with troops, but they may do this at an earlier period. At the close of the second year of the upper cadet school those cadets who have the requisite age and physical development are admitted to the ensign's examination, and, if successful, receive a conditional appointment as brevet ensigns (*Porte-épée-Fähnriche*), and enter at once on service in the ranks.

Likewise at the same period of the course in the cadet schools a "select" class of especially meritorious cadets is formed, which at once begins a course of preparation for the officers' examination. The course consists entirely of military subjects and languages, and is very much the same as that of the war schools. This class, which is small, receives officers' commissions directly, forming an exception to the rule that candidates must first pass through the brevet ensign grade in the ranks, and that they must be voted upon by the regimental officers.

The policy of making the cadet school a part of the military educational system has been much discussed. Its opponents urge that the character of the education is inferior to that of the civil schools, that the methods of discipline are so mild that the boys will get no idea of military life from the experience, that the boys so educated become unfit for the occupations of civil life, that it is an error to put boys into the military profession at an age when their taste or fitness for it has not been developed, that it tends to create a special military class, that favoritism is shown to the cadets over those who enter from civil life pure and simple. On the other hand, the friends of the system claim that by taking the boys at an early age, advantages are gained, which overweigh these objections. As a result of the discussion the decision seems to be in favor of increasing the number and capacity of the cadet schools rather than diminishing them. At present the cadet schools do not provide more than one third of the officers necessary for the army, and the balance is made up in other ways.

A young man who wishes to enter the army as an officer, without passing through the cadet schools, must first be nominated by the colonel of the regiment in which he desires to serve. He then serves as a private for six months, with certain privileges in recognition of the fact that he is a candidate for a commission, and he is called an " advantageur," or aspirant officer. During this time, usually at the beginning, he must pass an educational test. This may be satisfied by the production of a diploma either from a gymnasium or royal school (technical school) of the first class. The examination of those who do not possess evidence of having pursued a sufficiently high course of study embraces principally: (1) a good knowledge of the German language; (2) a translating knowledge of a foreign modern language; (3) arithmetic; algebra, up to equations of the second degree; use of logarithms; plane geometry and trigonometry. The instructors are directed to arrange the course according to the ability of the pupils; they are forbidden to force them to take up lines for which they have no talent; memorizing is discouraged, and useless detail is eliminated. The aim of all education is to train the character as well as the mind, and to do this the above method is considered best.

After at least five months' uninterrupted service in the ranks, the candidate is passed upon by his company, battalion, and regimental commanders, from whom a certificate is necessary, setting forth that judging from his physical, mental, and moral qualities, his deportment, zeal, and the degree of practical knowledge of the service he has acquired, they deem him worthy to continue in the service with a view to advancement.

(*b*) *War Schools* (*Kriegsschulen*). — The advantageurs and cadets not of the Selecta class gain their military instruction at a war school, after having fulfilled the necessary requirements of the ensign examination and service in ranks.

There are ten war schools in Prussia, situated at: Anklam, Cassel, Dantzig, Engers, Glogau, Hanover, Hersfeld, Metz, Neisse, Potsdam. At these schools a corps of 172 officers is stationed, and the aggregate attendance of students is one thousand. Admission may take place as early as seventeen and a half years, and the term lasts ten months. The course of studies is strictly military, even languages and mathematics being excluded. It includes: tactics, the science of arms, field fortifications, topography, regulations.

Those ensigns who successfully pass the war schools are reported to the " Superior Military Examination Committee," with a view to taking the officers' examination. The members of the Selecta, having followed a course exactly similar to that of the war schools, are also admitted to the officers' examination if deemed proficient. After the examination they return to their regiments for further service, generally several months.

An exception to the rule of attendance at war schools is made in favor of students who have attended a university, a technical high school, or a forestry academy for at least a year. Young men of this class, though required to undergo the practical test, the result of which is described in the certificate of their superior officers, may, upon the recommendation of the latter, be admitted to the officers' examination without previous attendance at a war school and without serving a full term of six months in the ranks. Still another exception is made in favor of officers of the reserve transferred to the active army. The aggregate number of those who enter under these exceptions is quite small.

The nomination to the sovereign of a person who has passed the officers' examination for appointment as second lieutenant must be accompanied, except in the case of the Selecta class of the cadet schools, by a statement of the officers of his regiment or independent battalion that they regard the nominee as fit to become their comrade, and that he possesses the practical knowledge of the service which is indispensable to an officer. If the majority of the officers refuse to join in such a statement, the next senior ensign is at once voted on; but if the election of a candidate be opposed by a minority only, the reasons of the latter for their dissenting view are submitted to the commanding general, who decides what weight, if any, is to be attached to them. In order that officers may have an opportunity to form an estimate of the mental and moral qualities of the ensigns, the latter, during a part of their service, are admitted to the officers' mess and are otherwise brought into frequent contact socially and officially with the officers.

B. Schools for Commissioned Officers. — The schools of this class partake of the character of postgraduate schools or schools of application.

(*a*) For cavalry there are two riding schools, one at Paderborn (*Offizier-Reitschule*) and one at Hanover (*Militär-Reit-Institut*). The school at Paderborn is for cavalry officers only, and has a staff of five officers and instructors and forty-one students. Attached to the school there is a detachment of ten noncommissioned officers, eighty-four men, eighty officers' horses, and fifty troop horses. The school at Hanover centralizes the methods of horsemanship throughout the empire. It is under the supervision of the Inspector General of Cavalry and of the Cavalry Board. The personnel consists of twenty-three officers as instructors and staff.

There are one hundred and thirty-three student lieutenants at the school, of whom ninety-one belong to the cavalry and forty-two to the field artillery. The course is usually one year, but the most proficient are retained for another year to practice a more extended course. Among the novel methods of the school is the hunting, with a government pack of hounds. Since 1888 all higher officers of cavalry go to Hanover each year to take a course of a few weeks in the chase and in jumping.

(*b*) For field artillery there is a firing school at Jüterbog, which trains officers from all field artillery regiments as instructors in gunnery. The personnel consists of twenty-four instructors, and there is an instruction regiment (*Lehr-Regiment*) with forty-four officers. The course lasts for five months, and the instruction is under the control of the Inspector General of Field Artillery. In 1910 it was proposed to send seventeen general officers for a short course at the school.

(*c*) The infantry schools are under a major general who is subordinate to the Inspector General of Military Instruction. Those infantry schools which are intended for officers are: (1) The Military Gymnastic Institute at Berlin, which trains officers of cavalry, artillery, and infantry to act as athletic instructors and fencing masters. It has a staff of four officers. (2) The School of Musketry at Spandau, which has three courses: (*a*) The information course for field officers of cavalry and infantry, lasting ten days. It was attended by 118 officers in 1909. (*b*) The instruction course for captains and lieutenants of cavalry and infantry, lasting twenty days. It was attended by 452 officers in 1909. (*c*) The course for noncommissioned officers. It was attended by 540 noncommissioned officers of cavalry and infantry in 1909. The object of the school is to instruct officers in target firing and in the use of small arms so that they may act as instructors when they return to their regiments, to hunt out discrepancies in the present firing regulations and in the methods of instruction in the different parts of the empire, and to suggest methods by which they may be removed; to watch the development of small arms and small arms practice in foreign armies; to answer any questions of the Minister of War on the subject; and to plan and examine sites for target ranges. Attached to the school are twenty-one officers, of whom six remain throughout the entire year, and the balance do duty with their regiments during the winter. It was proposed during 1910 to send eleven generals to the school for a short course. (3) There is a battalion of instruction at Potsdam, designed to coördinate the methods of instruction throughout the army. To it are attached about seventy-five officers and five hundred and sixty-four men.

(*d*) The Foot Artillery Firing School (*Fussartillerie-Schiess-schule*) is at Jüterbog. It is under control of the Inspector General of Foot Artillery, and has for its object the training of officers and noncommissioned officers of all foot artillery regiments as instructors in gunnery. It has twelve instructors, and is provided with an instruction battalion (*Lehr-bataillon*) of nineteen officers.

(*e*) The Technical Military Academy (*Militär-Technische Akademie*) at Berlin is under the supervision of the Inspector General of Military Education, and is commanded by a lieutenant general, with twenty-two officers as assistants. Its object is to complete the professional instruction of officers of foot artillery, engineers, pioneers, and communication troops. It also includes more extended courses in the higher scientific branches of armament and the engineer and communication services. There are three divisions of the course: (1) Armament (with eighty-seven lieutenants of artillery and infantry). (2) Engineering (with forty-seven lieutenants of engineers). (3) Communications (with twenty-two lieutenants of cavalry, artillery, infantry, train, and communication). The majority of the officers leave at the end of two years. The third and fourth years' course is followed by a small number of those who are most proficient.

(*f*) The War Academy (*Kriegs-Akademie*) at Berlin, founded in 1810, is the highest military school of the system. The general object of the institution is to raise the scientific spirit of the army; its special object is to give such an education to the most talented officers of all arms, after they have proved themselves possessed of the practical qualifications of good regimental officers, as will fit them not only for appointments on the staff, but for all responsible positions of high rank, for the command of regiments, for employment as instructors of military schools, and for all duties which require scientific attainments, both in military and in general subjects, of a higher degree than those ordinarily possessed. The War Academy is located in Berlin, under the control of the Chief of the General Staff of the Army. The immediate command is vested in a general, who is assisted by a board of studies and a personnel of twenty-three officers as instructors and staff. There are 480 students. The course embraces three consecutive years.

An officer who takes the examination for the War Academy must have had at least three years' service as an officer, and must have satisfactory reports from his commanding officers as to his familiarity with the practical part of his duties, his health, strength, and character, conduct, and pecuniary affairs. The entrance examination is intended to ascertain whether the applicant is sufficiently advanced in general education and knowledge on special branches of learning to enable him to attend the lectures of the academy with profit. It is also designed to determine whether his powers of discrimination and judgment are such as to give promise of further satisfactory development. Accordingly the subjects for examination are so chosen as not merely to test the memory, but also to afford the applicant the opportunity to demonstrate his ability to express his thoughts in a clear, coherent, and effective manner. The examination embraces the military branches of tactics, applied tactics, the science of arms, permanent and field fortifications, study of ground, and topographical drawing, and the following branches of general science, — history, geography, mathematics, and French (optional).

Reference to previous papers shows that the candidate for the War Academy must make good use of his time in order to fit himself for this examination. There is no repetition of subjects covered in previous schools, but he is called on to draw upon the fund of information which he has acquired by service with troops.

The course of instruction continues on the general lines indicated by the entrance examination, with the option of mathematics or a language, which may be either English, French, Russian, or Japanese. At the close of the course the work of each officer is described with much care and particularity, but no class standing is announced.

C. Schools for Noncommissioned Officers and Men. — In Germany the ordinary noncommissioned officer rarely becomes an officer. Occupying an intermediate position between the officers and the troops, they form a corps by themselves. Much care is bestowed on them. For noncommissioned officers there are seven preparatory schools at: Annaburg, with a commissioned staff of eight officers; Bartenstein, with a commissioned staff of eight officers; Grieffenberg, with a commissioned staff of eight officers; Jülich, with a commissioned staff of eight officers; Neubrisach, with a commissioned staff of ten officers; Weilburg, with a commissioned staff of eight officers; Wohlaw, with a commissioned staff of eight officers.

Candidates may be admitted at the age of fifteen years. The course lasts two or three years, depending upon the previous education of the students. These preparatory schools have the same relation to the noncommissioned officers' schools that the cadet schools have to war schools. About one fourth of the noncommissioned officers are provided by schools which are located as follows: Biebrich, with a commissioned staff of eighteen officers; Ettlingen, with a commissioned staff of eighteen officers; Jülich, with a commissioned staff of twelve officers; Potsdam, with a commissioned staff of twenty-three officers; Treptow, with a commissioned staff of twenty-two officers; Weisenfels, with a commissioned staff of twenty-two officers; Marienwerder, with a commissioned staff of eighteen officers. There are about 4000 men in these schools.

D. Schools for Auxiliary Services. — These may be enumerated as follows: King William Military Medical School (*Kaiser Wilhelm-Akademie für das Militärärtzliche Bildungswesen*) at Berlin. Military Veterinary Academy (*Militär-Veterinar-Akademie*) at Berlin, with thirteen officers as instructors and staff. Military Horse Shoeing School at Berlin (*Militär-Lehrschmiede*) personnel of seven officers. Other schools are in Breslau, Frankfort, Hanover, Karlsruhe, Königsberg. Military orphan schools at Potsdam and Pretzsch, with four officers. Cavalry Telegraph School (*Militär-Telegraphenschule*) at Berlin, with ten officers as staff. Wallmeisterschule at Strassburg, with three officers as staff. School of Fortress Construction (*Festungsbauschule*) at Charlottenburg, with four officers in charge. Artificers' School (*Ober-Feuerwerkerschule*) at Berlin, with eighteen officers detailed as staff and instructors. School for Sons of Soldiers (*Militär-Knaben-Erziehungsanstalt*) at Annaberg, with five officers assigned to it for duty.

The military schools of Saxony and Bavaria, except in minor particulars, are exact duplicates of those of Prussia; and thus complete the educational system of the German Empire.

Remarks on Prussian System. — From the foregoing, the conditions of military education in Germany may be summarized as follows: (1) Proof of a fair general education is required either by the certificate of a public school or by passing the ensign's examination. (2) From five to six months' service in the ranks, as a minimum. (3) Ten months' professional instruction at a war school. (4) Proof of professional knowledge by passing an officers' examination. (5) Acceptance by the officers of the candidate's regiment. Thus there is a double examination and two probationary periods of service with troops.

In Germany the principle of deferring the strictly military part of a man's education until after a good grounding in general education is well established. No serious attempt is made to give a special military education at an early age. The junior cadet schools give a mild sort of discipline and some elementary military exercises, but not enough to partake of the character of military education. Up to the age of seventeen or eighteen the future officer receives the same kind of an education as a civilian, and in a great majority of cases gets it at the ordinary public schools of the country. The only exception is in the Selecta class of the cadet schools, which receives military instruction before actually joining the service, but in this case the special instruction does not commence until the age of seventeen. After the candidates have had service in the ranks, however, they receive most careful professional instruction in the war schools. The course of these schools is essentially of a practical character, comprising only strictly military subjects and excluding such studies as mathematics and even languages.

A notable point of contrast between the Prussian and the other systems is the absence of competition in the former. There is, in fact, universal objection to competitive methods because it is the desire to discourage everything like the schoolboy feeling among officers, partly from fear that it may lead to jealousy and ill feeling among them, and diminish the spirit of comradeship to which so much importance is attached in the German army. Other claims are that competition prevents individuals from devoting their talents to subjects for which they have a natural taste, that it encourages an abnormal attention to useless details, gives undue prominence to the man whose chief ability lies in the memory, and the greatest objection urged is that it is impossible to make an examination that will test all the qualities which go to form military capacity. All examinations are made of a qualifying nature, and in furtherance of the same general idea promotion is not made by selection, but by seniority. To form an estimate of the capacity and general character of all officers there is provided an elaborate system of inspections and reports. If an officer is passed by a junior in promotion, it is a sign that he is no longer considered competent and he must retire from the service. Usually they are given previous warning on this point. It is supposed that this system cultivates the mind, directs the attention to broad principles, and promotes good feeling.

In the German system it will be observed that mathematics does not hold a high place in the training of an officer. A knowledge of mathematics up to trigonometry is all that is required for admission to the army, but the subject is not taught in the war schools in connection with the examination for an officer's commission. In the scientific schools, it is true, some proficiency in mathematics is required, but it is not of a high standard. The principle seems to be that the higher branches of mathematics can only be studied with advantage by a few who have real talent in that line, and that it is a waste of time to force the study upon those who have not a taste for it.

More importance seems to be given to the moral and physical qualifications of an officer than to actual performance in classroom. A knowledge of at least one foreign language is a necessary condition for admission. No particular prominence or encouragement is given to the technical services and scientific corps. It is, in fact, rather a disadvantage for those who seek advancement through the General Staff to comply with the requirements of the technical schools and then prepare themselves for the War College course of three years. As promotion is based on seniority as a rule, there are only two ways by which a man can get ahead of his comrades of the same grade and age. (1) The Selecta classes of the cadet schools are able to get an advantage of about a year. (2) Officers who are appointed to the General Staff as captains have their commissions antedated three years, and this same advantage may be gained a second time, if, as majors, they are again selected on the General Staff. Apparently only a few of the General Staff come from the scientific corps. It is not considered that these cases are violations of the rule against competition. As stated before, selections are based on reports showing character and mental and physical qualities combined.

The most notable feature in the German system is the close connection of the schools with the army, whereby the information gathered in the school is constantly applied in the everyday work of the army.

France. — Military education is controlled by a Central Executive Committee entitled "Permanent Instruction Board of Military Schools," at the head of which is a general of division. He is invested with the right to control the discipline of the schools, military education, and the general organization of instruction, and also the initiation of all measures relative to the material organization of the schools and the elaboration of programs of instruction and education.

A. Schools for the Preparation of Candidates for the Officer's Commission. — The junior cadet schools of the military class have been for the most part abandoned because of the conviction that it was not an advantage to begin a military education at an early age. The only survivor of this class is the Military Orphan School (*Prytanée Militaire*) at La Flèche, which continues to educate the sons of men who have done meritorious service. It has 500 students, of whom 300 have their expenses entirely paid and 120 partly paid by the government. Entrance is at the age of ten years by a qualifying examination. Graduates receive the degree of Bachelor of Science, and are prepared to enter Saint-Cyr and the Polytechnic. Although under military discipline, with a military personnel of forty-five officers, and although intended to prepare young men for the military profession, there is no obligation of that kind. In the ninety-five years of its existence something more than half of its graduates have been officers of the army.

Preparation for the officers' commission may begin for those who enter from civil life in two schools, the Polytechnic (*L'Ecole Polytéchniqu?*) at Paris, and the Special Military School (*L'Ecole Spéciale Militaire*) at Saint-Cyr, in both of which service of one year in a regiment is required. Since 1907 there is a strictly competitive examination, requiring graduation at a high school and also special work. The polytechnic school at Paris prepares cadets for artillery, engineers, and other technical services in the army and navy. The course lasts two years, beginning at the age of sixteen or seventeen. It gives a preparatory civil education, almost entirely of a mathematical character, and is a scientific school of high class under military discipline. Its graduates are commissioned as second lieutenants in the corps for which they have prepared. The military element is not prominent. During summer there are two drills per week only. In fact it is not a *military* school, although three fourths to two thirds of its pupils enter the army. It is a sort of mathematical university, a degree at which is a necessary condition of admission to certain departments of naval, military, and civil services. The staff and personnel consists of seventy officers and numerous civil instructors. There are 350 cadets, of whom 100 are at the expense of the State.

The Special Military School at Saint-Cyr is a companion institution to the Polytechnic, preparing cadets for the cavalry, infantry, and marines. The course is two years, beginning at the age of sixteen or seventeen years. The requirement of one year previous service in a regiment has resulted in the suppression of military exercises in ranks at the school. The rifle is rarely carried. Instruction is essentially practical, with the object of forming instructors and officers, and no longer almost exclusively soldiers. The one year's service with regiments is used in the case of cavalry cadets to develop in important proportions their general and military knowledge. They join the class of noncommissioned candidates for Saumur in the courses of history, geography, and topography, and are besides employed in the training of young horses. There are about 900 cadets, furnishing about one third the officers necessary. Its graduates predominate in the higher grades and at the Staff School. About half are pay cadets, the remainder free. The military and instruction staff is sixty-five officers.

The recruitment of the corps of officers is further provided for by three schools for noncommissioned officer candidates who are deemed worthy of advancement. In each of these the requirements of admission are two years' service and an educational requirement equal to that offered by the higher primary schools. It is expected that in this way the candidates will be able to enter the service with the same degree of preparation as their comrades from Saint-Cyr and the Polytechnic. The course in each is about one year. (1) The Cavalry School constitutes a section of the Cavalry School of Application at Saumur. (2) The Artillery and Engineer School (*L'Ecole Militaire de l'artillerie et du génie*) at Versailles. It has a staff of twenty-two officers. (3) The Infantry School (*L'École militaire d'infanterie*) at Saint-Maixent, maintains a staff of thirty-one officers.

B. Schools for the Completion and Improvement of the Education of Officers. — (*a*) The Cavalry School (*L'École de Cavalerie*), at Saumur, has a number of courses, so that it combines the school of application with the preparatory school for officers and noncommissioned officers. The courses are: (1) School of application for cavalry, consisting of forty-five officers, one from each brigade, preparing for the duties of instructors in equitation. (2) School of application for artillery and engineers, consisting of forty officers, preparing to act as instructors in equitation. (3) School of application for second lieutenants of cavalry on graduation from Saumur, consisting of eighty to ninety officers, completing their instruction in equitation.

The school has fifty-six instructors and permanent staff officers. The course is one year.

(*b*) The School of Application for Artillery and Engineers (*L'École d'application de l'artillerie et du génie*), at Fontainebleau, furnishes the advanced military and technical instruction needed in these arms. The school is under the command of a general officer with the assistance of forty-seven officers. The course is two years.

(*c*) School of Musketry (*L'École normale de tir*), at Chalons, has for its object, first the preparation of officers to act as instructors of musketry, and second, as a station for general experimental purposes in matters pertaining to musketry. It has several courses, varying from six weeks to three months and a half. The school is conducted by a personnel of sixteen officers.

Closely connected with the School of Musketry at Chalons are the schools of application for lieutenants of cavalry, infantry, and engineers, one at Camp Reichard and the other at Camp Valbonne, with courses of about six weeks, and a corps of instructors of about ten officers.

(*d*) School of Explosives and Mines (*L'École d'application des poudres et saltpêtres*), at Paris, is recruited entirely from graduates of the Polytechnic and is intended for an advanced study by engineer officers.

(*e*) School of Gymnastics (*L'École normale de gymnastique*), at Joinville-le-Point, trains a limited number of officers and noncommissioned officers as instructors in gymnastics and fencing, in order to insure a uniform method of instruction in all that concerns these exercises throughout the army. The course lasts six months. There are eight officers permanently detailed.

(*f*) School of Aerial Navigation (*L'École d'aerostation*) gives technical instruction in the service to a certain number of detailed officers.

(*g*) Artillery Schools (*L'École d'artillerie*), one for each brigade of artillery, with the object of completing the instruction of the officers of this arm and of noncommissioned officers aspiring for promotion.

Annexed to the school of this class at Poitiers is a practical course for majors and captains of artillery, lasting from three to six months according to the rank of the officers. It includes the study of the changes in the construction and employment of field artillery at home and abroad.

(*h*) School of Field Fortification (*L'École des travaux de campagne*). This school is attached to the school for the first engineer regiment at Versailles. Its object is to train officers of infantry in the construction of field works in time of war. The course is four weeks.

(*i*) The War School (*L'École supérieur de guerre*), at Paris, has a two-year course, thirty-three instructors and directors, and 280 students. It is open to the best students of the Polytechnic and to competition by graduates of Saint-Cyr. Upon graduation the students serve two years with cavalry, two years with infantry, one year with artillery before they are eligible for staff appointment. The day's work begins at six or seven o'clock and continues until five P.M., with the exception of one and one half hours. Much of the time is taken up with outdoor work, and the evenings are free.

As an adjunct to the war school an additional class for higher officers is about to be started to study the duties of high command. The course will be six months, and the first class will consist of twenty majors and lieutenant-colonels.

C. Schools for Noncommissioned Officers and Privates. — Preparatory schools are provided for the sons of soldiers, pensioners, and deceased officers, where education and instruction is given at the public expense to train them as noncommissioned officers. The State assumes a guardianship in a way over these children (*enfants de troupe*), and gives them an allowance in money for the earliest age, and at the age of thirteen admits them into one of six military preparatory schools. The schools are located as follows: For cavalry at Autun; for artillery and engineers at Billom; for infantry at Rambouillet, Montreuil-sur-Mer, Saint-Hippolyte-du-Fort, and Andelys. The aggregate number of students accommodated at these schools is 3000, with 34 officers in charge of instruction and discipline.

A school for soldiers' orphans (*Orphelinat Hériot*), established by private endowment, takes boys at ages from five to thirteen years, and serves as a preparatory school for the higher class. It is under military supervision and control.

Through out the army there are in every regiment schools for the soldiers (*écoles régimentaires*). The schools are of two kinds: (1) primary, for the illiterate, and (2) for noncommissioned officers who desire promotion. The cavalry school at Saumur provides several courses for noncommissioned officers and men, as follows: (1) School for noncommissioned officers preparing for officers' commission, consisting of over 100 men who have gained admission by competitive examination. (2) The school for saddlers, with 100 workmen. (3) The school for sixty to eighty apprentice farriers, detached from regiments, to which they return with a warrant as farrier sergeant. (4) School for cavalry telegraphers, consisting of two groups of 100 each, detached from regiments, to take the course each year. (5) The school of veterinary students who come to complete previous training before entering the army; there are twenty-six to thirty of them.

D. Schools for Auxiliary Services. — (*a*) The School of Administration (*L'Ecole d'administration*) at Vincennes is intended to instruct specially qualified noncommissioned officers with a view to advancement to the grade of officers in the supply departments and sanitary service. (*b*) School of Sanitation Service (*L'Ecole du service de santé*), at Lyons, supplements the medical course of students and gives them the necessary military training. The course is six months under a corps of nineteen instructors. (*c*) School of Application for the Sanitary Service (*L'École d'application du service de santé*), at Paris, receives the graduates of (*b*) and imparts theoretical and practical instruction.

Austria-Hungary. — *A. Preparatory Schools for Officers.* — Preparation for military life begins early. As in Germany, the young men go through a series of military preparatory schools, beginning at the age of ten years. The schools, called military technical schools, are similar to the corresponding public schools designed to lay a foundation for a scientific education. They are of two classes, named respectively Upper and Lower Schools. The Lower Schools (*Unter-Realschulen*) have a three-year course, and are located at Enns, Steiermark, Fishau, Moros Vásárhely, St. Pölten, Kösneg. They have about 140 officers on duty and 900 students. The military orphan school at Hirtelberg is of this class.

The Upper Schools receive the graduates of the former for a four-year course. They are situated at Kismarton and Mahrisch Weisskirchen, with about 70 officers and 450 students.

The military academies receive the graduates of the Upper Schools for three years. Preparation for the academies may, however, be obtained elsewhere, in public schools or private educational establishments. The age of admission would be about seventeen years. The expenses are either borne by the State, which is the most common case, or they make full or half payments.

The Theresa Academy at Neustadt is the institution which educates officers for the cavalry and infantry. It has fifty officers and 450 students. The Technical Military Academy of Vienna prepares for artillery, engineers, and other special services. It has forty-six officers and 279 students. The graduates of the academies are commissioned directly into the army. The recruitment of the corps of officers is further provided by a large number of cadet schools, with a two-year course. There are fifteen of these for infantry, some of which are also open to the cavalry, with an aggregate of 345 officers and 2400 cadets. They are located at Vienna, Budapest, Prag, Königsfeld, Pozsony, Innsbruck, Temesvár, Nagyzeben, Liebenau, Lobszów, Carlstadt, Marburg, Kamenitz, Lemburg, and Kassa.

The cavalry also has a special cadet school at Mahrisch Weisskirchen, with 24 officers and 150 students.

The artillery school is at Traiskirchen, with 50 officers and 350 cadets.

The pioneers have a school at Hainburg, with 25 officers and 160 cadets.

After graduation at the cadet schools the cadet is assigned to a regiment as a cadet, with actual or honorary position as noncommissioned officer. As vacancies occur they may be appointed cadet officers' substitutes (*Cadet Officiers Stellvertreter*) in which they exercise the function of officers, and associate with them without actually holding rank as officers. Having completed a probationary period in this position, they may be nominated for commissions, after having received the approving vote of the officers of their regiments.

B. Schools for Officers. — (1) The Special Technical School of Artillery, Engineers, Building Construction, and Civil Schools (*Technische Militärfachkurse*) at Vienna. (2) School of Musketry (*Armeschiess-schule*) at Vienna. (3) Artillery School of Fire (*Artillerie Schiessschule*) at Vienna. (4) Riding Masters' School (*Militär-Reitlehrerinstitut*) at Vienna. (5) Fencing and Gymnastic Institutes' School (*Militär-Reit-und-Fahrlehrerinstitut*) at Schlosshoff bei Marchegg. (6) School of Instruction in Riding and Driving (*Militär Fecht und Turnlehrerinstitut*) at Vienna. (7) War School (*Kriegs-schule*) at Vienna, has a permanent staff of 26 officers and 136 students.

C. Schools for Enlisted Men. — Schools for one-year volunteers are established in each regiment, and divisional schools in each division.

D. Schools for Auxiliary Services. — (1) The Military School of Administration (*Administrative Militärfachkurse*) at Onna. (2) Military Medical School (*Militär ärztliche Applikationsschule*) at Vienna. (3) Veterinary School (*Tierarztliche Hochschule*) at Vienna. (4) Cavalry and Infantry Telegraph Schools (*Telegraphenkurs*) at Tullin.

Italy. — The military schools of Italy are under supervision of a Superintendent or Director of Military Education.

A. Schools for the Preparation of Candidates for the Officers' Commission. — Preparation is usually made at the junior cadet schools or the military colleges of Rome and Naples (*Collegi Militari*), both conducted under the same regulations and with the same entrance examinations. The earliest age at entrance is thirteen years. The course is about the same as for boys of corresponding age at certain of the public schools, and takes four years. Entrance is competitive.

The military colleges are preparatory for the senior cadet schools, of which there are two: the Military School (*Scuola Militare*) at Modena for cavalry and infantry cadets, and the Military Academy (*Accademia Militare*) at Turin for engineer and artillery cadets. Admission to these schools is competitive, as in the colleges, and they are also open to graduates of civil schools, and deserving soldiers. The course in the military school at Modena is two years. No mathematics is taken by the cadet, except what is included in the subjects of physical and natural sciences. On graduation a cadet receives his commission as an officer of cavalry or infantry. The course at the Military Academy of Turin is three years, and the sciences occupy a prominent part in the schedule. On graduation a cadet receives his commission as an officer of artillery or engineers, but antedated one year in order to adjust the rank. It will thus be seen that cadets who pursue the usual course will be officers at a minimum age of nineteen years. About one third of the vacancies go to meritorious noncommissioned officers, for whom a special course is provided at the school of Modena, with a term of two years.

B. Schools for the Completion and Improvement of the Education of Commissioned Officers. — Upon graduation from the military schools the candidates are commissioned and are sent to the schools of application for their branch of the service. The second lieutenants of cavalry go for a course of ten months to the Cavalry School of Application (*Scuola di Cavalleria*) at Pinerola, immediately after graduating at Modena. A second course provides for training of officers as riding instructors, and a third course is given to officers preparatory to passing their examination for promotion. The second lieutenants of heavy artillery and engineers go for two years longer to the School of Application for their arms (*Scuola d'Applicazione d'Artigleria e Genio*) at Turin. The second lieutenants of field artillery enter the Artillery School of Fire (*Scuola Centrale di Tiro d'Artigleria*) at Nettuno; in the infantry the lieutenants go to the School of Fire (*Scuola Centrale di Tiro di Fanteria*) at Parma. Several additional courses are provided: —

(1) Course for preparing cavalry and infantry officers to enter the War School at Turin, — four months. (2) Course for preparing infantry officers for their promotion, — three months. (3) Course for students of the lowest class of the war schools, — forty days. (4) Course for noncommissioned officers who seek commissions in the accounting departments, — two years. The Royal School for Carbineer Officers (*Scuola Allieri Officiale Carabinieri Reali*), and the military fencing school (*Scuola Magistrale Militari di Scherma*) are at Rome. The War School (*Scuola di Guerra*) at Turin is the highest school, and is designed to qualify officers who have had three or four years' service for duty in the General Staff. Entrance is competitive for cavalry and infantry, but no examination is required for those who have graduated at the higher schools of application for artillery and engineers. The course takes three years, and is conducted by 44 officers with 165 students.

C. Schools for Noncommissioned Officers and Men. — The most important is the abovementioned section of the Modena School, which prepares intelligent and deserving noncommissioned officers who aspire to the grade of officers for admission to the military schools.

D. Schools for Auxiliary Services. — The principal schools of these kinds are: The Military Sanitary School of Application (*Scuola d'Applicazione di Sanita Militare*) at Florence. The Military Geographical Institute (*Instituto Geografico Militare*).

Great Britain. — *A. Schools for the Preparation of Candidates for an Officer's Commission* are to a large extent limited to two,— the Royal Military Academy at Woolwich, and the Royal Military College at Sandhurst. Entrance is at the age of seventeen or eighteen years. Admission is strictly competitive, except for a small number of King's cadets, who are subject to a qualifying examination only. Graduation from the sixth form in English secondary schools, which is equivalent to entrance to a university, qualifies for Sandhurst and Woolwich, but there are also numerous private schools which prepare for both.

The Royal Military Academy at Woolwich prepares cadets for artillery and engineers. It has a one-year course, and accommodates 200 cadets, with 40 officers. The cadets are organized and held under military discipline. The course of instruction is largely taken up with military subjects.

The Royal Military College at Sandhurst is the preparatory school for the cavalry and infantry branches. The course is one year, mostly devoted to military matters. It contains 400 cadets and 36 officers. The amount paid by cadets depends upon ability to pay, and ranges from £ 150 per year to nothing. King's cadets receive a gratuity from the age of thirteen in order to prepare them for entrance examination. The weekly routine takes up forty hours per week or about five hours for class and study and three hours daily for drill. In a year there are about three months of vacation.

Among the novel disciplinary methods to be noted is the rule that cadets have an allowance of pocket money which, in amount, depends on cadet rank. It is taken away when under punishment. Cadets reduced to ranks are not graduated unless they are reinstated at least to the grade of corporal.

The characteristic features of the Woolwich and Sandhurst schools are the brief periods of instruction and the exacting competitive standards of admission. The ordinary arguments for and against these methods continue to be heard, with the general result that the tendency is to increase the length of the course.

Among the schools having a military character which serve as preparatory institutions are the Duke of York's Royal Military School at Gaston, the Royal Hibernian Military School at Dublin, and the Queen Victoria School at Dunblane.

In addition to the royal schools described, entrance to the regular corps of officers can be obtained: (*a*) by nomination of recognized universities to candidates fulfilling the academic and military qualifications, (*b*) by competition to officers of auxiliary and colonial forces.

B. Schools for Commissioned Officers. — (*a*) The Ordnance College at Woolwich has four courses: (1) the ordnance course for officers of the army and marines, (2) the gunnery staff course for officers and noncommissioned officers, (3) the master gunner's course,. (4) the artificer's course. The course lasts one year, with thirteen officers permanently assigned and twenty-six students.

(*b*) The Engineering School at Chatham has three courses: (1) for officers of the Royal Engineers, (2) for officers and enlisted men of the Royal Engineers, (3) for officers and noncommissioned officers and men of the line. The officers for instruction and administration number seventeen.

Other schools of this class are: (*c*) Cavalry School at Netheravon, takes thirty officers for six months. (*d*) School of Gunnery at Shoeburyness. (*e*) Mounted Infantry School at Longmoor. (*f*) School of Musketry at Hythe. (*g*) School of Gymnastics at Aldershot and Curragh. (*h*) Staff College at Camberley. The Staff College performs the ordinary mission of a college of its kind. The college maintains a permanent personnel of sixteen officers and ninety-eight student officers.

C. Schools for Noncommissioned Officers and Enlisted Men are conducted in connection with a majority of the schools noted. In addition there are numerous garrison schools, which furnish certificates of three kinds. Promotion to the rank of corporal requires a third-class certificate, to the rank of sergeant a second-class certificate, and the other more important noncommissioned officers must have a first-class certificate. (*a*) The School of Cookery, Aldershot, has a course of three months for noncommissioned officers. (*b*) The Royal Military School of Music is at Kneller Hall for training of bandsmen of all ranks. (*c*) For training of assistant instructors in riding there are establishments at Canterbury, Woolwich, and Aldershot. (*d*) A course for saddlers is provided at Woolwich dockyard. (*e*) A course of instruction for soldiers to qualify as chiropodists is formed. (*f*) A course for tailors is provided at the Royal Army Clothing Factory.

D. Schools for the Auxiliary Services. — (*a*) The Royal Army Medical College at Grosvenor Road, S.W. (*b*) The Royal Medical Corps School at Aldershot. (*c*) The School of Signaling at Aldershot. (*d*) The Army Service Corps School at Aldershot. (*e*) The Army Veterinary School at Aldershot. (*f*) The Balloon School at South Farnborough has twelve officers for a seven weeks' course. (*g*) The School of Electric Lighting at Plymouth and Portsmouth for officers of engineers and heavy artillery. (*h*) The School of Economics provides a six months' course in commercial and business training.

There are a number of military schools and colleges in the colonies, as: (*a*) The Indian Staff College, at Quetta, with forty-nine student officers. (*b*) The Indian Cavalry School at Saugor. (*c*) The School of Musketry at Bloemfontein, S.A. (*d*) Schools of Musketry at Pachmarli, Satara, Changla Gali, Mayengo, India. (*e*) The Royal Military Academy at Kingston, Canada.

Comparison of the system of military education in Great Britain with that of other countries shows less time devoted to study and less exacting qualifications for the grade of officer than in most countries.

Switzerland. — This country presents many novel features in her military and educational system, because she is the only country in the world which has formed an efficient scheme of national defense based entirely on a militia system. The preparatory training of the Swiss youth for military service begins early. Between the ages of ten and twenty years a course of gymnastics and elementary drill is made obligatory at public schools and elsewhere. To this is added rifle firing for the older boys, so that much of the "rawness" of the recruit has disappeared before they present themselves for enrollment. The principle that every able-bodied male citizen must help to defend the State applies to all between the ages of twenty and forty-eight years, who are not exempted by law. The first twelve years are passed in the active army, and the next eight years are put in with the first reserve, or *Landwehr.* Finally, the eight years up to the age of forty-eight are in the second reserve, or *Landsturm.* Thus the active army is divided into twelve classes, according to age. Each year the young men who reach the age of twenty years report for duty as recruits. At the same time the class of those who pass the thirty-second birthday go into the first reserve, while still another class finish their term of service in the first reserve at the age of forty years.

A date is fixed when the young men of the recruit class present themselves for enrollment. They are then examined; the unfit are excused, the fit are assigned to the most appropriate branch of the service. They are armed, equipped, clothed, and instructed in the school of the recruits for ninety days in the cavalry, seventy-five days in the artillery, and sixty-five days in the infantry. At these schools the skeleton regiments, battalions, or companies necessary to give the entire body of recruits a technical organization are first formed by calling upon the newly appointed officers and noncommissioned officers in sufficient numbers. This is then an important part of the training of others besides the recruits.

Immediately after finishing his recruit course the soldier takes his place in the active army as a member of a company located near his home. Subsequent service of instructed troops is as follows: For cavalry, privates, and corporals, eight annual trainings of eleven days each; for infantry, seven annual trainings of eleven days each; for artillery, seven annual trainings of fourteen days each. The artillery, infantry, and other troops of the first reserve, cavalry excepted, have one annual training of eleven days. Thus the total service as a private of cavalry is 178 days, 184 for artillery, and 153 for infantry. These days are in addition to the days of reporting and dismissal. When they are counted, the total will be from eighteen to twenty-seven days more. It is to be observed that a day is counted for a full eight hours of hard work, in which all the time is occupied in a manner that has been carefully studied and planned beforehand. Each special arm has a course of its own. The butchers, bakers, teamsters, and others so essential to a field army, are organized, drilled, and worked in the way they should go.

Volunteer shooting clubs are subsidized by the government when they use the military firearm according to military rules. They are an important feature of the military system; every soldier between the ages of twenty and forty must either fire a course at one of these meetings once a year or attend a three days' course of practice under military supervision.

For officers and noncommissioned officers the course is extended to thirty days. This training is in addition to other military service, and of course greatly increases the aggregate time given to the state by each man. In 1905 there were 3694 of these shooting clubs in that small state, with a membership of 220,147. The United States, being thirty times more populous than Switzerland, would, at the same rate, have 100,000 such clubs with a membership of six million and a half members, at an annual cost of two million dollars. That six million and a half membership will also represent the proportional number of armed, trained, and organized soldiers, maintained at a cost of half that of our own military establishment.

Advancement in the army depends upon ability and the time given to learning the duties of a soldier. Promotion to the grade of corporal comes on the recommendation of superiors, after the candidate has satisfactorily passed his recruit course and followed the course of training prescribed for the new grade. The sergeants are taken from the corporals, so that, after four years, a man has not ordinarily been able to get his commission as an officer. The principal schools for noncommissioned officers last thirty-five days for cavalry and artillery and twenty days for infantry, with corresponding courses for other arms. After qualifying as noncommissioned officers, they at once act as instructors at the recruit schools of the next class, and then take their regular annual course with the active army, so that in the year when a man becomes a corporal of cavalry he has 136 days' service, 124 days in artillery and 106 days in infantry. This course was taken by 2095 men in 1906.

Noncommissioned officers, or soldiers who are declared qualified, enter a preparatory school for officers lasting eighty days for cavalry and infantry, 105 days for artillery, and corresponding periods for other services. They are appointed lieutenants if satisfactory, and immediately practice their functions as such at a recruit school, and again follow it up with the annual training with their regiments. So that the lieutenant, in the year when he qualifies, devotes 181 days to military service in cavalry, 194 in artillery, and 156 in infantry. Seniority rules in promotion to first lieutenant. Above and including the rank of captain, promotion is by selection among the best officers.

Numerous schools are provided for officers. After reaching the rank of lieutenant, officers must remain four years in each grade, at least, so that they cannot reach the grade of colonel in less than twenty years. Before becoming captains they must successfully pass through the thirty days' course for captains and command a company at a recruit school. Before being promoted major, they have a course of fifty days, and command a battalion of recruits. Lieutenant-colonels and colonels have tactical exercises without troops for eleven days every other year. Candidates for the general staff have a seventy days' course. The general staff is the branch upon which the higher duties of the military profession are placed; their special work lasts from two to three months at a time. Thus, in an average case, it will take about forty-five days each year devoted to military duties in order to get regular promotion, and it will take about eight years to a captaincy.

About 220 instructors of all kinds are required to give the necessary direction to the various branches of military training. They constitute about the only permanent establishment in the army, and are under pay at all times. A portion of the general staff may be included in this. Notwithstanding the apparently exacting nature of the calls for military service in a country where it is fulfilled at the same time that a man pursues his ordinary vocation, it has been calculated that working hours are reduced only 1 per cent thereby.

Turkey. — Turkey has a good system of military education, commencing with the primary grades and continuing up to a complete war school course. It was introduced with other military reforms by the distinguished general, Von der Goltz, who succeeded in a very short time in giving the country a first-class army.

A. Preparatory Schools. — There are twenty-eight junior schools of this class, of which six are situated at Constantinople and the others are distributed among the principal cities. The boys wear uniforms, but are not quartered in barracks, receive no military instruction, properly speaking, and are under no obligation to enter the army unless they are otherwise bound by the law. The program of instruction simply conforms to that of the ordinary primary school. The course of instruction lasts four years. The head or director of each school is a military officer who has a number of officers as assistants, but most of the teachers are civilians. The military colleges are seven in number, and may be classed as senior cadet schools. The course is three years, and its character is distinctly military, most of the teaching personnel being military, and considerable military instruction being imparted. These colleges are usually placed at the headquarters of the Army Corps districts. Although specially designed to prepare for the army, there is no obligation to serve.

Those cadets who are desirous of entering cavalry and infantry join the Cavalry and Infantry School (*Mekteb i harbié*) at Constantinople. On graduation the pupils are commissioned in the infantry and cavalry as second lieutenants, while the unsuccessful are sent to join a regiment with the rank of first sergeant.

The School of Artillery and Engineers (*Muhendis-Khané i berri i humayoun*) at Constantinople prepares officers for the artillery and engineers of the line of the army, as well as for fortress artillery. It has a military and scientific course which lasts four years. On graduation successful cadets join the army as second lieutenants. Those specially recommended at the end of the course, not more than one tenth of the class, undergo a further technical course for three years, on the completion of which they are promoted to be captains.

B. Schools for Officers. — The best of the graduates of the Cavalry and Infantry School, as well as a few of the higher graduates of the Artillery and Engineers' School, are assigned to take the course of the Staff School (*Erkiam i harbiê mektebi*). The course is three years, and graduates are assigned to the General Staff with the rank of captain. The curriculum compares favorably with the other war colleges in Europe.

C. Schools for Noncommissioned Officers. — As only a small proportion of the officers come from the military schools, the balance is furnished by the promotion of meritorious noncommissioned officers, for whom there are appropriate schools.

D. Schools for Auxiliary Services. — The Military School of Medicine (*Mekteb i funoun thabie i chahanê*) at Constantinople has a six years' course. Graduates enter the Sanitary Corps with the rank of captain, and take an additional two years in a military hospital.

A veterinary section is attached to the Cavalry and Infantry School, and graduates receive the rank of captain veterinarian.

China. — The plans for an imperial army were made in 1907, and contemplated the formation of thirty-six divisions of troops, two for each province, before 1912. The scheme has met with numerous delays in execution, but the progress made has been remarkable. At present the number of students of the officer class is about 10,500, distributed as follows: —

At twenty-nine junior cadet schools, 6000 students; at three senior cadet schools, 1550 students; at one school for nobles and members of the royal family, 200 students; at one school for the rapid instruction of officers, 1140 students; at six provincial schools for rapid instruction of officers, 810 students; at one school for instructors, 120 students; at one provincial war college, 120 students; total, 9940 students.

There are also 500 officers and military students in Japan and thirty in Europe. Two graduated at West Point recently.

There are as yet no schools of application, and it is found necessary to provide officers at an exceedingly rapid rate for the new divisions from schools of instruction, in which the course is necessarily abbreviated. It is expected that the great Central School for Officers will be ready in 1911 and that the War College will be opened in 1916. Under present plans the army will need annually about 1500 officers, which will be completely provided by the national schools. This will be done in 1912, when there will be nearly 13,000 students, distributed as follows: —

In junior cadet schools 6000 students, or 2000 per year; in senior cadet schools 3600 students, or 1800 per year; in war schools 3200 students, or 1600 per year.

The ordinary progress of the Chinese officer will be as follows: entrance at a cadet school at age of fifteen years; at junior cadet schools, three years; at senior cadet schools, two years; service in ranks, four months; at war schools, eighteen months; service in ranks, six months. Thus at the age of twenty-two years and four months he becomes an officer. After two years with his regiment he may enter the War College, if specially selected for the honor, and will graduate in two years more.

Here again we have the German system. In addition to the officers' schools there are everywhere schools for noncommissioned officers and men. The school in fact is one of the most important parts of the soldier life, and the army is today the most important factor in the introduction of western thought and learning throughout the country. Thousands of young men are learning to be officers, and the battalion schools of the army of 250,000 men are devoting two hours of study each day along with six hours of drill. The military profession is now honored where formerly it was despised. It is sought by the most favored youth of the land. Everywhere a sentiment of national patriotism is taking the place of former indifference. If improvement continues at the same rapid rate, it will not be long before China will be one of the greatest military powers in the world.

Japan. — In all military nations, and in Japan particularly, the army is a school of the highest quality in which the habits of discipline and self-respect are formed and the principles of honor and patriotism are taught. In the public schools there is a military color given to the conduct and to the sports of the students which prepares them for their military service. Bushido is taught, and Honor occupies the first place in the list of studies. (See JAPAN, EDUCATION IN.)

The military educational system is based on the German.

A. Schools for the Preparation of Candidates for the Grade of Officer are of two kinds, (*a*) Cadet Schools (*Chuo Yonen Gakko*), which prepare for the ensign (*Shikwan Kohosei*) examination, and (*b*) the War School (*Skikwan Gakko*), which prepares for the officers' examination.

(*a*) Cadet Schools are of two grades, a senior and a junior grade. The junior cadet schools are six in number, and are located at Tokyo, Osaka, Sendai, Nagoya, Hiroshima, and Kumamoto with an aggregate of about 127 instructors and administration officers and 900 students. Pupils are admitted at the age of thirteen years, and remain three years. Many of them are sons of officers and soldiers, and the same argument is made in Japan as in other countries for and against their continuance. The additional objection is made that their expense is excessive, costing three million yen per year.

At the end of three years the cadets are transferred to the senior cadet school at Tokyo, where the course is for two years. The Tokyo institution has about 530 cadets and a corps of 76 officers and instructors, a part of whom are attached to the junior cadet school at the same place. About 80 per cent of the cadets pay their own expenses. The five years at the cadet schools may thus be supposed to have been completed at the eighteenth year.

The cadet schools furnish less than half of the candidates for officers, so that provision is made for candidates for commission direct from civil life. They enlist as one-year volunteers or candidates for commissions, with the approval and consent of the colonels of the regiments in which they desire to serve. These candidates enjoy certain privileges and at the end of the year of service they take the examination for ensign, or they are appointed without examination, if they possess a diploma from a civil school of sufficiently high grade. Having reached the grade of ensign, they take their place with the graduates of the cadet schools for the next step.

(*b*) The candidate school for officers (*Shikwan Gakko*) at Tokyo corresponds to the war schools of many other countries, and receives the ensigns for one year. It is commanded by a major general, assisted by 104 officers, and accommodates about 720 students, divided into six sections according to whether the cadets are to enter the cavalry, field artillery, infantry, engineers, heavy artillery, or train. Upon graduating, their candidacy is passed upon by the officers of their regiments, and if the result is favorable they are commissioned as officers by the Emperor.

B. Schools for Commissioned Officers, or Schools of Application. — (*a*) *The Cavalry School of Application* (*Kihei Jisshi Gakko*), at Tokyo, has a term of one year with two courses, (1) Tactics, for captains and lieutenants, (2) Equitation and Hippology, for lieutenants and sometimes for noncommissioned officers. Probably officers and noncommissioned officers of the artillery and train are also admitted. At the close of the first year the best are selected for a second year as instructors. There are about 33 instructors and 136 student officers at this institution.

(*b*) *The Field Artillery Firing School* (*Yasen Hohei Shageki Gakko*) has a course of eight months for captains and one of four months for lieutenants of field artillery and mountain artillery. There are about twenty instructors and twenty-two students.

(*c*) *The Infantry School of Application* (*Toyama Gakko*), at Toyama, has a term of about one year, and three courses: (1) Tactics for captains and lieutenants of infantry, and sometimes of engineers and heavy artillery; (2) Gymnastics, firing, and musketry for lieutenants and some noncommissioned officers of all arms; (3) Music course for musicians. The school has 45 officers in the permanent personnel and 145 officers as students.

(*d*) *Artillery and Engineering School of Application* (*Hoko Gakko*), at Tokyo, is commanded by a major general, assisted by fifty-nine officers, and it instructs 230 students, who are second lieutenants. Although the course is usually one year, the best students are given a second year, and at the close of the second term the best are again designated for study abroad. There are courses in field and heavy artillery and engineering.

(*e*) *The Heavy Artillery Firing School* (*Juhohei Shageki Gakko*) has three courses: (1) for captains and lieutenants of artillery, eight months; (2) for captains and lieutenants, four months; (3) for captains and field officers who have completed studies in the telegraph battalion and for noncommissioned officers who desire to study electricity. It has a staff of nineteen officers and fifty-four students.

(*f*) *The Staff College* (*Dai Gakko*), at Tokyo, tops the system, with a three-year course. It is commanded by a lieutenant general, with a staff of 46 assistants and 159 students. It dates from 1883.

C. Schools for Noncommissioned Officers and Enlisted Men. — In addition to the schools for ensigns and certain selected noncommissioned officers, there are many other schools for enlisted men.

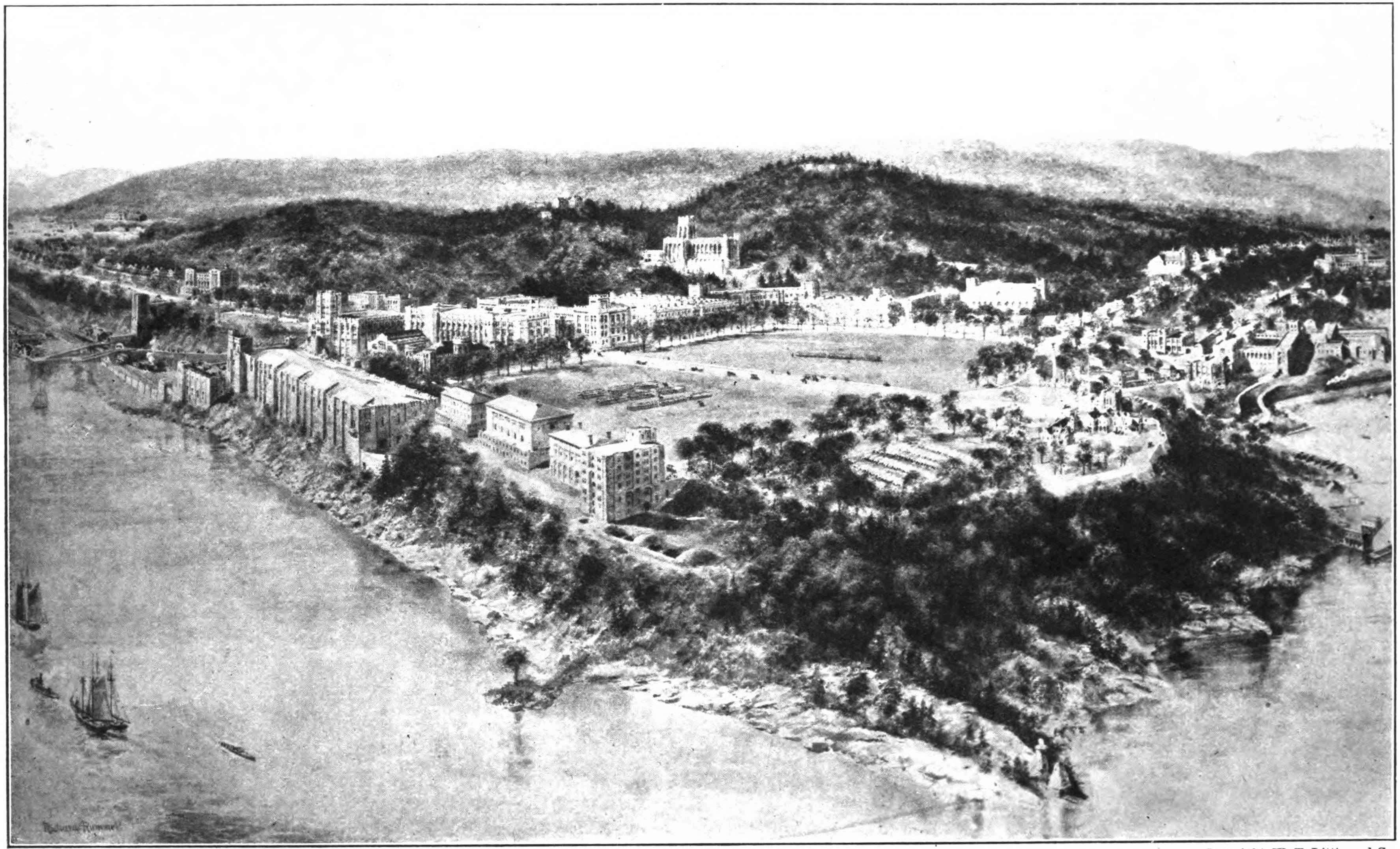
(*a*) *The Artillery Master Workman's School* has five courses: (1) Pyrotechnic section, (2) Master Saddlers' Sections 1 and 2, (3) Master Armorers' Sections 1 and 2, (4) Master Wheelwrights' Sections 1 and 2, (5) Master Blacksmiths' Sections 1 and 2. (*b*) *Veterinary School* (*Jui Gakko*) at Tokyo, for farriers, has a five months' course.

All army divisions have probationary schools for officers, aspirant officers, and noncommissioned aspirant officers.

D. Schools for Officers of Auxiliary Services. — (*a*) *The Intendance School* (*Keiri Gakko*), at Tokyo, for officers, probationary officers, and intendance cadets. It has a staff of 29, and 131 students for about two years. (*b*) *The Army Medical School* (*Guni Gakko*) at Tokyo. (*c*) *The School of Military Topography.*

In 1876 when the new army was fairly started there were 2131 students in military schools; in 1893 there were 2602 students; in 1908 there were 2755. This will evidently be increased to correspond to the increased size of the army since the Manchurian campaign.

United States. — *A. Officers' Preparatory Schools* in the United States are confined to two classes. The first class consists of a single school, the Military Academy at West Point. Cadets are admitted at the age of seventeen on nomination by a congressman or by the President of the United States, the number of can-



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West Point Military Academy.

didates allowed to each being regulated by law. The course lasts four years. A qualifying examination is required, or a certificate of graduation at a public school of good standard. All expense is borne by the government. The Military Academy closely resembles the military scientific and technical schools of other countries, where cadets are prepared for engineers, coast artillery, and other scientific branches of the service. Its prototype in Europe would be the Military Academy at Modena, in Italy, or the Polytechnic School of France.

The West Point system developed by itself, and probably was little influenced by other schools. One of its most distinctive features, for which great merit has been claimed, is due to the provision in the law of 1812 which prescribed that cadets shall " be trained and taught all the duties of a private, noncommissioned officer and officer." The result is to give instruction in the duties of all arms of the service. In other countries this part of an officer's military education is usually given in two probationary periods of service in the ranks with troops, and that the duties of all arms are not learned by all officers. Much unjust criticism of West Point has been due to ignorance of its place in military education. Always a preparatory school of a high class, it has never been a war college. Its greatness is due to the high character of its graduates, and not to the course of study pursued by its alumni. The higher duties of command must be learned in another school. The suggestion has been made that perhaps it is time to defer to foreign experience in the plan of the Military Academy, and to form each class into two sections, one an Engineer-Artillery section and the other a Cavalry-Infantry section, each with a course of study appropriate to future service.

The second class of cadet schools is composed of certain civil schools in which " Military Science and Tactics" forms a part of the curriculum. It is a large class of nearly one hundred institutions, although only ten of them have the privilege of furnishing commissioned officers to the army. At these schools there are ninety-two officers detailed as military instructors.

At the inspection of 1910 22,147 students were present. About 10 per cent of the attendance in 1909 were at ten schools rated as " Distinguished," and another 10 per cent were at strictly military institutions. About 15 per cent had target practice on the range. A part of the attendance consists of boys under fifteen years of age, and in this respect these schools are like the junior cadet schools.

Under the provisions of General Orders, No. 231, War Department, Nov. 16, 1909, these institutions are divided into five classes, as follows: —

Class A. — Schools or colleges whose organization is essentially military, whose students are habitually in uniform, in which military discipline is constantly maintained, and one of whose leading objects is the development of the student by means of military drill, and by regulating his daily conduct according to the principles of military discipline.

Class B. — State land grant or agricultural colleges established under the provisions of the act of Congress of July 2, 1862, which are required by said act to include military tactics in their curriculum.

Class BA. — Any college of Class B which attains the state of efficiency required for schools or colleges of Class A shall be classed as BA.

Class C. — All schools or colleges not essentially military which maintain a course of military instruction equal or superior in character and hours of instruction to that required of institutions of Class B.

Class D. — All other schools or colleges at which officers of the army may be detailed and which do not maintain a course of military instruction equal to that required of institutions of Class B, and at which such instruction is regarded as nominal.

Institutions, not exceeding ten, whose students have exhibited the greatest application and proficiency in military training and knowledge during the year are designated annually as " Distinguished Institutions."

B. Schools of Application. — These are provided for every branch of the service.

(*a*) The Mounted Service School at Fort Riley, Kansas, for officers and noncommissioned officers of the Cavalry and Field Artillery, has three courses: (1) Training school for officers. (2) Training school for horseshoers and farriers. (3) Training school for bakers and cooks. It has ten officers as staff and military instructors, and thirty-six student officers. The course is one year.

(*b*) The Coast Artillery School at Fort Monroe, Va., has a two-year term divided into three courses: (1) Regular. (2) Advanced. (3) Enlisted specialists. It has an instructional staff of sixteen, and twenty-four student officers.

(*c*) The Engineering School at Washington Barracks, D.C., has a course in civil engineering and a course in military engineering, with a term of one year, five instructors, and a class of fourteen officers.

(*d*) The Army School of the Line at Fort Leavenworth has four courses in a year of time: (1) Military Art. (2) Engineering. (3) Law. (4) Languages. It has twenty-four officers in the staff and as military instructors, and thirty-six students. An engineering school of the line is about to be formed at the same place. A portion of the instructors are assigned also to the Army Staff College, to be mentioned later.

(*e*) A School of Musketry for Cavalry and Infantry is provided at Monterey, Cal.

At all military posts there are garrison schools for officers, in which a great amount of work is prescribed.

(*f*) The most advanced schools of the army are the Army Staff College, Fort Leavenworth, Kan., with a course lasting one year and a class of twenty-three; and finally the Army War College at Washington, D.C., with a permanent personnel of eight officers and twenty-one students, for one year. The War College course may be compared with that of the third year at the German *Kriegs-Akademie,* the Staff College course with the second year, and the Army School of the Line with the first year at that institution.

C. All posts are provided with *schools for enlisted men,* but attendance is not compulsory. Schools for bakers and cooks are at Washington Barracks, D.C., and at San Francisco, Cal. Schools for saddlers and for battery mechanics of Field Artillery are located at Rock Island, Ill. At many of the officers' schools there are courses for noncommissioned officers, as noted.

D. Schools for Auxiliary Services. — (*a*) An Army Signal School at Fort Leavenworth, Kan., instructs fourteen officers every year.

(*b*) An Army Medical School at Washington, D.C., maintains a personnel of ten officers as staff and instructors, and sixty students.

The notable features of military education in the United States are the lack of coördination between the different institutions, and the fact that graduation at a war college is not an indispensable requirement for the general staff.

A scheme by which the military departments of the civil schools may be available in the plan of national defense is a matter of importance. Many of these schools compare favorably with the preparatory military schools of other countries, and they ought to be of great service to the country.

In no country of the world are officers required to spend more time on military education than in the United States, or to maintain a higher standard. It has been suggested that the standard is too high in respect to the scientific knowledge required from officers of all arms of the service. If there are faults in the military system, they are not in the military education, but rather in the lack of coördination, in the obsolete methods of promotion, in the difficulty of obtaining units at war strength for practical work.

Other American States. — Canada maintains a Royal Military College at Kingston, which furnishes a few officers to the regular army of Great Britain and also to the local reserves. Entrance is secured by competition, the course is three years, and the Corps of Cadets numbers about 100.

In the Mexican army there is a system of compulsory military education, strict attention at the classes being enforced. The soldiers are for the most part Indians, and when they join the ranks are almost without exception illiterate. They are given instruction in reading, writing, arithmetic, natural sciences, history, drawing, and singing. For officers there is the Military School at the Castle of Chapultepec, which provides about one third of those who receive commissions.

In Chile there is a very good system of military education prepared under German influences. *A.* The preparatory schools for officers consist of: (1) The Cadet School (*Escuela de Cadetes*). (2) The Military School (*Escuela Militar*). *B.* The schools for officers are: (1) The Cavalry School (*Escuela de Caballeria*). (2) The Artillery School, firing included (*Escuela de Artilleria*). (3) The Infantry School, including musketry, gymnastics, and fencing (*Escuela de Infanteria*). (4) The War College (*Le Academia de Guerra*). *C.* The schools for enlisted men are: (1) Preparatory School for Noncommissioned Officers (*Escuela Preparatoria de Sub-oficiales*). (2) Noncommissioned Officers' School (*Escuela de Sub-oficiales*). All of the schools except the War College are under the control of the Inspector General of Education. The War College is under the Chief of Staff.

The scheme of military education of Argentine, like that of Chile, is based on German models and is complete and comprehensive.

In other South American and Central American states the scheme of military education is in various stage of development, with a constant tendency to improvement.

Military Educational Methods. — Most of the educational systems just described are devoted to purely academic instruction, and might just as well be given at any civil school. The use of giving a military character to the preparatory schools has often been disputed, but the idea that a certain amount of military training and discipline is beneficial for youths of every age seems to be gaining. This kind of military training is far from being military education, and might also be obtained in the ranks or in volunteer companies. Both the academic education and the military training or drill are therefore considered necessary before a man becomes an officer. The actual duties of commanding men in gradually increasing numbers must be learned later. The Military Academy at West Point is probably the finest preparatory school of this kind in the world.

After entering the body of officers the purely professional part of military education begins, and this is the particular function of the schools of application and the staff schools or war colleges. Some of the advanced schools for the scientific branches continue to hold much of their technical character, but the scholastic element is quite absent in the schools where officers are sent to learn the higher duties of their profession.

It would be quite easy to fill the course of these schools with the pedantic military learning of many centuries. The mass of stuff of this kind is immense, and was greatly increased after the Napoleonic wars by numerous commentators who claimed to have discovered in many fantastic rules and maxims the secret of his success. It soon became evident that most of this would have to be put aside, and that military education would have to follow another line.

As war is one of the most ancient and honorable of all the vocations of man, it strikes us at once as remarkable that it should have been so long and successfully conducted without the paraphernalia which in comparatively recent years have been thought necessary. The criticism is just, but easily explained. The wars of mobs and strong men were characterized by deceit and perfidy or by drill and discipline, and were won by the side which showed most proficiency in one or the other. The armies were small and easily handled. The world was often at the mercy of inferior races, ridiculously small in numbers, neither great in courage nor wise in mind. But the age of invention changed all this. The invention of gunpowder increased the length of each man's arm, brought the knight to a level with the peasant, and made new varieties of skill necessary for success. The invention of steam made it possible to feed and assemble greater armies than ever before. The policy of universal liability to service, quick mobilization, and peace training has given us the "Nation in Arms." To train officers for their new responsibilities, so much greater and more complicated than ever before, is the object of military education.

To teach men their duties in war by peaceful means without giving them the experience of war was the greatest difficulty to be met. In other words, to give them practical instead of theoretical methods of instruction was the important end of all instruction. Practical methods of instruction had indeed been found and long practiced by all other professions. The schools of medicine, electricity, law, engineering, and others, of late years have constantly improved and developed the practical course. They have reached the point where theory and practice go hand in hand, teaching principles by practical examples, and sending out graduates from their universities who are ready to begin the active practice of their profession.

The difficulties of giving a practical military training in time of peace disappear on an analysis of the situation, which shows: First that most of the situations requiring practical knowledge by officers can be studied apart from the battle itself and even away from the presence of troops. Second, that one thing should be learned at a time, following the sequence of events as they would present themselves in actual service. Third, that by a proper selection of examples for study an officer will be able to gain a variety of experience closely resembling that obtained in real war.

This, therefore, is the applicatory or deductive system, involving the study of concrete cases instead of the abstract study of principles. The principle and the illustration may be considered together, but it is better to study the example first and decide on the principle afterwards. It is like the method of the child in learning to speak the language before learning the grammar, for here we study the campaign first and pick out the principles afterwards, thus reversing the former methods.

It will be apparent that our system has decided advantages over the actual school of war. During war the ground, the troops, the killed and wounded, conflicting reports, the sense of responsibility, the nervous strain, are all crowded upon us at once with a thousand variations. In our peace system every distracting influence is excluded, and every subject except the one proper to the case in hand.

Taking account only of the duties of officers, they may be divided into two classes — those conducted indoors and those conducted in the open. In the first class are map problems and map maneuvers; in the second class are staff rides or terrain exercises and maneuvers. Noticing them in the order named, there are map problems which are simply military situations stated in the form of problems for solution, and solved by the aid of a map. It is logical to consider them first, because the officer sees the map before he sees the ground, studies it, and makes his plans beforehand. The result of the study causes a decision to be reached which is stated in the form of an order to the troops. This order is the foundation on which the entire structure of command is built. To acquire the habit of issuing correct and sound orders takes much time and is reduced to a beautiful system. It makes no difference what the size of the command may be. The map maneuver comes next, and resembles in a way the ancient game of chess. The checkerboard is represented by a map of large scale, the pawns are replaced by blocks or markers indicating tactical organizations, and the rules are governed by the well-known powers and limitations of troops in moving over varying conditions of ground. The map maneuver tests the correctness of the decision made in solving the map problem. By these simple means many varieties of military questions are usefully studied, practiced, and decided.

The first kind of outdoor exercise has been called a war ride, although it may be a walk as well. Its distinctive feature is that the map of the map maneuver is here replaced by the real ground. The troops remain absent because of the rule to learn one thing at a time, and it is well known that the officers would otherwise have their attention largely devoted to personal direction of the troops. The object is still to practice the officers in making quick and accurate decisions, and for this the troops may continue to be imaginary.

Finally the troops themselves appear upon the stage, and the officers may now be said to be ready to take up the mechanical duty of handling the men. This part of the military education is called the maneuver stage. It is also progressive in its character, beginning with an enemy whose position is outlined at first by flags and markers, ending at last with troops actually represented as an enemy, with both sides firing blank ammunition. This is the last rehearsal in time of peace for the serious drama of war. In most respects it gives a practical demonstration of war, lacking only the element of danger, which cannot be supplied in peace.

Abundant experience has shown that this method of military education in time of peace furnishes armies in every way ready for war, not only ready but able to carry on war more efficiently than any other soldiers who ever lived. E. S.

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MILITARY SCHOOLS, PRIVATE. — See Military Education; Private Schools.

MILITARY TRAINING IN THE SCHOOLS. — See School Management.

MILL, JAMES (1773–1831). — The son of a shoemaker, born at Montrose, Scotland, and educated at the University of Edinburgh, where he distinguished himself in Greek and philosophy. Not succeeding as a preacher, he went to London as tutor in the family of Sir John Stuart. This constituted his educational experience, together with the training of his son, John Stuart Mill, an experiment of unusual interest. The education of this precocious child he kept entirely in his own hands and conducted according to his own peculiar ideas. The boy began Greek at three, and at eight had read in the original Æsop's *Fables*, the *Anabasis*, the whole of Herodotus, and six *Dialogues* of Plato, a translation of Plutarch, and the Histories of Robertson, Hume, Gibbon, Rollin, Burnet, and Mosheim. He had also begun the study of Latin, Euclid, and Algebra, and was teaching younger children. At ten he had read all the usual classical authors and more. At twelve he was studying Plato and Aristotle, and at thirteen Adam Smith and Ricardo. A detailed account of these studies is given in his *Autobiography* and in Bain's *Biography* of his father. The case was of singular psychological interest. This strenuous method of education produced an intellectual prodigy. Its most effective feature was the intimate association of the child with the vigorous intellect and character of his father and their partnership in scholastic pursuits. But the boy was not the passive victim of a mechanical process of indoctrination. In accordance with his favorite maxim that "one of the grand objects of education must be to generate constant and anxious concern about evidence," the elder Mill encouraged his son to collect and weigh evidence and to accept nothing upon authority. The boy was brought up as a thoroughgoing agnostic, and afterwards described himself as one of the few persons in England who had not thrown off his religious belief, because he never had any. He always averred that his childhood was not unhappy, although almost entirely lacking in the element of play, and that his tasks were not so severe as to prevent his healthy growth.

James Mill wrote much for the magazines on educational topics in later life, and took an active part in the founding of University College, London. His life in London was devoted chiefly to literary and philosophical pursuits, although he held an important office in the East India Company. His *History of British India* was his greatest literary work, and produced a complete change in the government of that country. Mill played an important part in English politics, and was the originator of what is known as "philosophic radicalism." The Reform Bill was carried through Parliament under his auspices. He was the chief friend and ally of Jeremy Bentham (*q.v.*), to the propagation of whose principles he devoted all his energies. His *Political Economy*, written primarily for the instruction of his son and following the lines of Ricardo, was a highly finished work. His *Analysis of the Human Mind*, which has been regarded almost as the Bible of associationism, won him a high position in psychology and philosophy. Its chief merit lies in its accurate definition of terms and clear statement of results. It simplified association (*q.v.*) by reducing it to a single form-association by continuity, and made great use of "mental chemistry" in fusing ideas and feelings and in showing that morality is based on utility. Thus he furnished a psychological foundation for Bentham's legislative and ethical reforms. W. R.

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MILL, JOHN STUART (1806–1873). — One of the greatest philosophical writers and thinkers of the nineteenth century; lived his whole life in London. Like Spencer, he had no university training, but was educated entirely by his father, James Mill (*q.v.* for this interesting educational experiment), in accordance with his own peculiar ideas. This rigorous discipline brought on in his twentieth year mental disorders from which he was rescued with difficulty. After a period of rest and foreign travel, he entered the service of the East India Company, in which he continued for thirty-three years. Much of his time was devoted to philosophical pursuits. In philosophy he was an empiricist, sensationalist, and associationist; in politics, a radical and individualist; in ethics, an utilitarian. He became an author at a very early age. His *System of Logic* is the most original of his works. It was severely criticized by Whewell and others from the scientific point of view, but it became a classic, and ensured him a high reputation in the educational world. His *Principles of Political Economy* followed closely the lines of Ricardo. His *Examination of the Philosophy of Sir William Hamilton* was his chief philosophical work. His *Essays on Religion, Liberty, Utilitarianism,* and the *Subjection of Women* attracted wide attention. His chief contribution to educational literature was his *Address Delivered at his Inauguration* as Rector of St. Andrew's University, which ranks with those of Spencer and Huxley, and exerted a profound influence upon the thought of his day. His thesis was that there is no real antagonism between classical and scientific studies, such as was then supposed to exist; and he raised the question, "Why not both?" He argued strongly for a full and complete education in both directions; but the curriculum which he advocated ruled out modern languages and literature entirely, made extravagant demands for ancient learning, and left little time for scientific training. It was a practical surrender to the classicists. W. R.

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MILLET, MME. — See Infant Schools.

MILLIGAN COLLEGE, MILLIGAN, TENN. — A coeducational institution founded in 1882 as the outgrowth of Buffalo Institute. Academic, Bible, collegiate, commercial, and musical departments are maintained. The entrance requirements are fifteen units of work. The college confers the degrees of A.B., B. Lit., B.S., and A.M. on completion of appropriate courses. The enrollment in the collegiate department in 1910–1911 was 134. The faculty consists of eleven members.

MILLINERY. — See Household Arts.

MILLS COLLEGE, OAKLAND, CAL. — An institution for the higher education of women, founded in 1871 as Mills Seminary, and the only woman's college on the Pacific slope. A preparatory department was maintained until 1911. The entrance requirements are fifteen units. The degrees of A.B., B.L., and B.S. are conferred in the classical, literary, and scientific courses. The enrollment in 1911–1912 was 121. There is a faculty of thirty-five members.

MILLS, CYRUS TAGGERT (1819–1884). — Founder of Mills College; was graduated from Williams College in 1844. He studied at the Union Theological Seminary, and engaged in missionary labors in Hawaii. In 1860 he became president of Oahu College, near Honolulu, and from 1864 to 1871 was principal of secondary schools in California. He founded Mills Seminary, now Mills College, in 1871. W. S. M.

MILLSAPS COLLEGE, JACKSON, MISS. — An institution chartered in 1890 under the control of the Methodist Episcopal Church South, and opened in 1892. A preparatory school, college, and law school are maintained. The entrance requirements are fourteen units. The degrees of A.B. and B.S. are conferred by the college. The law school grants the LL.B. after a course of two years without entrance requirements. There was in 1911–1912 an enrollment of 285 students in all departments. The faculty consists of fourteen members.

MILTON, JOHN (1608–1673). — During the English Civil War, as in other revolutionary periods, new ideas were in the air, not only in regard to politics and religion, but in every sphere of life. The stress of the war drove John Milton, already famous as a poet and a literary genius, to the practice of education as a profession, and, being what he was, also to write on the theory of education. In 1640 he set up house in Aldersgate Street, London, where he entertained a few select and aristocratic private pupils, whom he carried to prodigious lengths of learning. In 1644, at the invitation of Samuel Hartlib (*q.v.*), he published a *Tractate on Education*, and about the same time wrote a little schoolbook, not published till 1669, called *Accedence commenced Grammar*. The latter was written because the authorized Lily's *Grammar* made "two labours of one, by learning first the accedence, then the grammar in Latin, ere the language of those rules be understood" and purported to apply the only remedy, to join both books in one and in the English tongue. It was, in fact, a Latin grammar in English, much simplified, largely by omitting the exceptions to the rules. Though Milton's contemporary, Charles Hoole (*q.v.*), also translated Lily into English, Lily was destined to reign in Latin and produce a hatred for literature in many thousands of English boys for many years to come.

The *Tractate on Education* was also aimed at shortening the road to learning and to prevent "the waste of seven or eight years merely in scraping together so much miserable Latin and Greek, by giving a complete and generous education, which fits a man to perform justly, skillfully, and magnanimously all the offices, both public and private, of peace and war." This was to be done by substituting a knowledge of things for a knowledge of words. But Milton had no idea of getting at the "things" in English. He would have none of the modern tongue, *Janua* and *Didactics*, " more than ever I shall read," of Comenius (*q.v.*), then in great vogue. Things must be got at through Latin and Greek. This was sensible enough, as all the authors who wrote on " things," from agriculture in Cato, Varro, and Columella, and architecture in Vitruvius to physiology in Aristotle or *Cynegetica*, the " Book of the Dog," in Oppian were to be found in the two tongues. Grammar, therefore, was the real gate of learning, as it always had been since Latin ceased to be a spoken vernacular. But it was to be learned "out of some easy and delightful book of education," as Plutarch or Quintilian, " with lectures and explanations." In passing through this gate, and having passed it, the pupil was to study everything, — geography, trigonometry, fortification, engineering, navigation; " then out of some not tedious writer, physic, so that they may know how to manage a crudity." Only later were to come comedies and tragedies, followed by politics and laws from Moses and Lycurgus to Justinian and the common and statute law of England. During hours of exercise, which were not to be stinted, fencing, wrestling, music, riding, sailing, were to be learned. Italian was thrown in to be learnt at odd hours, and Hebrew, Syriac, and Chaldee on Sundays. In fact, like Quintilian's Orator or Machiavelli's or Elyot's Prince, every one by the rational system was to become a living cyclopedia.

If it had not been that Edward Phillips, Milton's pupil from the age of ten to seventeen, in his *Life of Milton*, bears witness to Milton's having actually taught the willing youth all these subjects by reading the books and enlarging on them with him, we might have thought Milton was writing a skit on the educational theorists of the day and of previous ages. Milton indeed admits that " this is not a bow for every man to shoot in that counts himself a teacher." The *Tractate* does not perhaps present an impossible program for exceptional private pupils with an " Ulysses " of a master. As a protest against the way Latin and Greek were taught then, and are in many schools still taught, it was perhaps of use. But it was of little use for the ordinary grammar schoolmaster. The theory was impossible of " application to the common herd in a common school by a common man." Milton remained a schoolmaster only for seven years, and his *Tractate* is perhaps only an example of the truth that it is not much use putting Pegasus into harness. A. F. L.

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MILTON COLLEGE, MILTON, WIS. — A coeducational institution established in 1844, and chartered as a college in 1867. An academy, college, and school of music are maintained. The entrance requirements are fifteen units. The college grants the A.B. degree on completion of appropriate courses. The total enrollment in 1911–1912 was 165. The faculty consists of fifteen members.

MIND. — In philosophy the term is used to designate that form or phase of reality which is contrasted with matter or body. Mind is the reality which thinks, feels, and wills, while matter is the reality which has extension and moves through space. In .psychology the term is used, not to designate an entity of some kind, but rather as a general term, to cover all conscious processes, present and potential, in any individual. The essential inner individuality of a person is his mind. In a narrower sense the term is sometimes used to refer more specifically to the knowing processes as distinguished from the emotional and volitional aspects of personality. In this sense mind is sometimes contrasted with soul or spirit. As contrasted with intellect (*q.v.*), mind is a broader term. As contrasted with spirit (*q.v.*), it is a narrower term. C. H. J.

MIND, DISEASES OF. — See Circular Insanity; Delirium; Delusion; Dementia; Derangement; Epilepsy; Fixed Ideas; Hallucination; Hysteria; Illusion; Insanity; Intoxication; Incoherence; Mania; Megalomania; Melancholia; Moral Insanity; Morbid; Obsession; Paraphasia; Psychiatry; Psycho-pathology; Will, Disorders of.

MIND READING. — The term refers to the tendency for mental states, particularly when accompanied by emotional value or other intense interest, to reveal their nature through involuntary indications, which in turn may be read by a shrewd observer. It may be well to dismiss the use of the term that implies a transcendent power to read the contents of another's mind by some form of alleged thought transference. (See Telepathy.)

The most familiar form of such interpretation is called muscle reading, a term that indicates the part played by involuntary contraction of muscles. Within this field the most familiar demonstration is that of indicating the mere direction of the object thought of or attended to. For this purpose an instrument such as the automatograph is helpful. The instrument consists, in one form, of a board suspended from the ceiling by a thread, and having inserted below it a bristle, or writing point, which traces its path upon a smoked paper or other suitable surface; in another form it consists of a glass plate carefully leveled, upon which are placed three polished balls, which in turn support a lighter glass plate, to which a recording device is fastened. In either case the hand of the subject rests lightly upon the recording board or plate; and he is directed to give the hand little thought and to absorb his attention in the task set. This may be sensory, as in listening to the beats of a metronome or following with his eyes a series of colors or words as they are successively exposed; or mental, as in tracing an imaginary walk or in thinking intently of a given object in a specified locality. The involuntary tracing thus obtained with a favorable subject will indicate the direction in which the object of attention was situated.

The more complex forms of muscle reading involve a similar revelation not merely of the *direction,* but of the *nature* of the mental content. Yet in the most familiar form of muscle reading the indication consists of the slight tremor or change of breathing or other nervous unsettlement when the point of interest is reached. Thus the muscle reader places the subject's hand upon his own forehead and holds it lightly, and by tentatively trying this or that move, or by pointing to this or that letter or figure on a prepared diagram, shrewdly judges from the delicate changes of tension when he has reached or indicated the object upon which the subject's mind is concentrated. In this way a needle concealed in a distant room, or a number of a bank note, may be found, and yet more delicate "muscle" tasks may be solved. Special studies have also shown the presence of involuntary whispering and other involuntary signals which may provide clues when one individual is trying to read the thought of another. (The shrewdness of dogs or even horses in similarly reading intentional or unintentional signs may also be noted.) Highly susceptible subjects will use the automatograph or the yet simpler form of "planchette," which carries a pencil, and actually writes words indicating the clues to their mental occupation; or reply by "yes" or "no" or other messages to questions, without full awareness of their actions. Such a phenomenon is known as "automatic writing," and involves a considerable departure from the normal state and a susceptible nervous temperament. Related to this are the forms of table moving and rapping, which again are pronounced and partly involuntary indications of the mental intent or content. That these trend toward the abnormal and imply states of high emotional tension is readily realized.

In the most recent methods of mental diagnosis an additional form of mind reading is available. If a subject be sent to another room with two envelopes, each of which contains directions to perform a set task, but only one of which he is to open, and if upon his return he be subjected to a series of association or similar tests, an examination both of the time period and of the nature of these associations may determine beyond doubt which of the two envelopes he opened and which of the two tasks he performed. The wider and more delicate application of this principle for the discovery of crime has recently excited attention. Throughout, the common principle is the revelation of the mental content by involuntary indications, which in turn are either a form of muscular expression or of an interference with the normal flow of the mental expression. The methods by which we read human expression and the underlying sincerity of candor, or the insincerity or perturbation of embarrassment are similarly conditioned.

J. J.

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MINERALOGY. — The science of minerals. See Geology; Technical Education.

MINING, EDUCATION IN. — See Technical Education.

MINISTRY, EDUCATION FOR THE. — See Theological Education.

MINISTRY OF EDUCATION, MINISTER OF EDUCATION. — The name frequently applied to that department of government which administers educational affairs. Its director or minister of education is usually a party politician, and holds office and is a member of the cabinet as long as his party is in power. Such ministries of education have in most countries been established within the last century, and in some the ministry of education is combined with other functions. The modern tendency, however, owing to the increased importance of education everywhere, is to establish separate bodies.

Germany. — The full development of ministries of education has not yet taken place in the German states. Educational affairs are either administered by the Minister of the Interior, by a Department for Ecclesiastical Affairs, or by a ministry which has charge of both public worship and education. (See Germany, Education in.) Here only the development of the central administration in Prussia will be dealt with. As long as education was under church control, it was administered and supervised by the church authorities solely. In the middle of the eighteenth century both church and school affairs came within the jurisdiction of the Department of Justice, from which they were separated and placed under the *Oberkonsistorium* in 1750. In 1787 a separate department for education (*Oberschulkollegium*) was established under the Minister for Church and School Affairs (then Zedlitz). In 1808 public worship and instruction was placed under a Minister for the Interior, from which in 1817 these functions as well as the charge of medical affairs were withdrawn and a new ministry established in the *Ministerium der geistlichen und Unterrichtsangelegenheiten,* which in the middle of the nineteenth century became the *Ministerium der geistlichen, Unterrichts- und Medizinalangelegenheiten,* or Ministry of Public Worship, Education, and Public Health. The Department of Public Health has been separated off since Jan. 1, 1911. There is a strong movement to establish an independent ministry for education. At the head of the ministry stands the minister, who is responsible to parliament for the management of affairs within his jurisdiction. He is assisted by an undersecretary. The educational section is divided into two departments, each under a director, the one dealing with university, secondary, technical, and art education; the other with the education of girls, physical training, and special institutions for idiots, blind, deaf and dumb. There are employed six sectional directors, thirty councilors, and twenty-three assistants.

England. — The chief executive officer responsible for the national educational administration is the President of the Board of Education, established by the Board of Education Act, 1899. In 1839 a Committee of Council was formed to superintend the application of the first national grant for education. In 1856 the Committee of Council and the Science and Art Department were united in the newly created Education Department under the Lord President of the Council, sitting in the House of Lords, and a new official, the Vice-President, with a seat in the House of Commons. In 1899, as a result of the suggestions of the Bryce Commission, the Board of Education Act was passed, providing for the creation of a Minister of Education, known as President of the Board of Education, responsible for primary, secondary, and technical education in England and Wales. (See England, Education in.)

The President is assisted by a permanent secretary. The board is divided into two main departments for England and Wales, although certain branches are common to both. The following are the branches into which the work is subdivided: architects, medical, women inspectors, legal, elementary education, secondary school, technological, university and training of teachers, and special inquiries and reports. Scotland and Ireland have separate departments for education, but are represented by the state secretaries for the respective countries.

France. — During the Revolution several experiments were made in establishing a central authority for education. From 1795 to 1808 there was a *Directeur Général de l'Instruction publique* in the *Ministère de l'Intérieur* ; this arrangement was continued under Napoleon, the director bearing the name of Grand-Maître. In 1815 a *Commission de l'Instruction publique* was established and continued until 1820, when it became the *Conseil royal de l'Instruction.* In 1822 the position of Grand-Maître was restored, and in 1824 education was placed under the charge of the *Ministère des Affaires ecclésiastiques et de l'Instruction publique,* from which it was separated in 1828, when a Minister of State for Education was appointed (*Ministère de l'Instruction publique*). To this ministry there was added in 1870 the department of fine arts (*Département des Beaux-Arts*). The ministry was reorganized in 1884. There are thirty bureaus under the control of the Minister of Public Instruction, of which seventeen have charge of educational affairs (cabinet of the minister, one bureau; higher education, five bureaus; secondary education, five bureaus; primary education, five bureaus; and accounts, one bureau). Each of the educational bureaus is under a director who is a professional expert.

United States. — Here there is no ministry of education. There is no federal authority over education. A bureau of education under the control of a commissioner of education was established in 1867 in the Department of the Interior. It has several times been proposed to establish a separate department of education under a state secretary, but it seems improbable that this plan will ever be carried out.

For the central authority in other countries see the separate national systems, *e.g.*, AUSTRIA, EDUCATION IN.

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MINNESOTA, STATE OF. — First organized as a separate territory in 1849, and admitted to the Union as the thirty-second state in 1858. It is located in the North Central Division, and has a land area of 80,858 square miles. In size it is one third larger than all New England, about one half as large as California, and about the size of England, Wales, and Scotland combined. For administrative purposes the state is divided into eighty-six counties, and these in turn into cities, towns, and school districts. In 1910 Minnesota had a total population of 2,075,708, and a density of population of 25.7 per square mile.

Educational History. — The first school for white children in Minnesota was established at the present site of St. Paul in 1847, two years before the organization of the territory; and when it was first organized in 1849 there were but three settlements in the territory: at St. Paul, St. Anthony, and Stillwater. The first territorial legislature in 1849 enacted the first school law. This provided for the appointment of a Territorial Superintendent of Public Instruction, to be appointed by the Governor for two-year terms, and at a salary of $100 per year; constituted each township having five families a school district, with a clerk and three trustees, but permitted the division into school districts if the township had ten or more families; and levied a county school tax of two and one half mills, to which was to be added all money derived from liquor licenses and fines for criminal offenses. The trustees had the power to examine and hire teachers. This law remained almost unchanged until 1860. The first report of the Superintendent of Public Instruction, for the year 1851, reports but eight districts and three schoolhouses in Ramsey County, and four districts and one schoolhouse in Washington County, and an enrollment of but 250 pupils in the state. In 1851 the legislature established the University of Minnesota, though the institution was not opened to students until 1868, the interval being spent largely in erecting a building and in struggling with debts in an effort to save the university's land endowment. In 1853 higher or grammar school classes were organized, and in 1854 a three months' term of school was required. In 1855 the office of Territorial Superintendent of Public Instruction was abolished, and no such official existed again under the territorial form of government.

In 1858 Minnesota was admitted to the Union. The constitution formed at that time made it the duty of the legislature to establish a general and uniform system of public schools; to provide for the sale of the school lands, the safeguarding of the principal, and the distribution of the income from the fund to the townships, on a census basis; provided for general taxation for education; and confirmed the University of Minnesota in its establishment and privileges. This section has remained practically unchanged ever since. An agricultural college was founded, by law, the same year, but in 1868 it was consolidated with the State university. The first state normal school, also, was established in 1858, and opened in 1860 at Winona. In 1868 a second state normal school was opened at Mankato, and in 1869 a third at St. Cloud. In 1860 the city of St. Anthony was authorized to establish a high school; town superintendents of schools were ordered to be appointed to examine and license teachers, and the chancellor of the State university was made *ex officio* State Superintendent of Public Instruction. In 1862 the town of Winona was permitted to effect a separate organization under a board of education; a county examiner, appointed by the county commissioners, superseded the town superintendent; and the Secretary of State became *ex officio* State Superintendent. In 1864 the appointment of a county superintendent of schools was authorized, if the counties so desired; in 1869 the appointment of such an official was required in all established counties; and in 1877 the office was made elective and required of all counties. In 1867 the Governor was authorized to appoint a Superintendent of Public Instruction, a plan that has been followed ever since. The state first began to care for the blind, deaf, and dumb in 1863, establishing three institutions for such defectives at Faribault; school district bonds were authorized first in 1866; state teachers' institutes were aided first in 1867; and state teachers' certificates were authorized first in 1868. In 1875 an important change was made in the method of distributing the income from the state school fund by providing for a forty-day enrollment basis, instead of a census basis, and this was also made to apply to the distribution of the state one-mill tax for schools, first authorized in 1887. In 1877 the constitution was amended to prohibit aid to sectarian education. In 1878 the state high school law was enacted, the policy of state subsidies for high schools begun, and a State Inspector of high schools appointed. The policy, begun here, has recently been extended to many forms of extra-educational effort. In 1878 women were permitted to vote at school elections. In 1885 state aid for school libraries was granted; a state school for dependent and neglected children established; the Minnesota state reading circle organized; and a compulsory education law enacted requiring twelve weeks' attendance of all children eight to sixteen years of age. In 1899 this law was amended so as to cover the whole time the schools were in session; in 1907 the child labor law was reenacted and made into a good law; and in 1911 the excuse of poverty for non-attendance was withdrawn. In 1901 the consolidation of schools and the transportation of pupils was authorized; in 1905 county rural school commissioners were authorized to redistrict the counties, and to locate consolidated schools; and in 1909 rural schools were permitted to vote to unite with a central town school for instruction in manual training, domestic science, and agriculture, and to put themselves under the supervision of the superintendent of the central town school. In 1911 state subsidies were granted for consolidation; state aid was granted for the erection of a consolidated school building; and an Assistant Superintendent of Public Instruction was appointed to help forward the consolidation of schools. Efforts were also made in 1911 to secure the creation of a State Board of Education. A constitutional amendment also was submitted in 1911, for the second time, to permit of the imposing of professional standards for the office of county superintendent of schools.

Present School System. — At the head of the present state school system is a State Superintendent of Public Instruction, appointed by the Governor, with the consent of the senate, for two-year terms. He receives a salary of $3000 and traveling expenses, and appoints a deputy superintendent at $1800. He has general oversight of the public schools of the state; meets with the county school superintendents and advises with them; makes provision for the county teachers' institutes, and apportions the State Institute Fund; provides for examinations for teachers' certificates in the different counties at times uniform throughout the state; holds examinations for professional state certificates; may grant permits to teach, and special certificates in certain cases; apportions the state school fund, and grants some of the subsidies for extra educational undertakings; and makes an annual report to the Governor. He is also a member, *ex officio*, of the State High School Board, the State Normal School Board, and the Board of Regents of the state university. The Attorney-General is the official adviser of the State Superintendent, and his opinions have the force of law until overruled by a court.

For each county there is a county superintendent of schools, elected by the people for two-year terms. The salary of the office is fixed by the county commissioners. If there are over 125 teachers in the county, a deputy may be appointed. It is the duty of the superintendent to visit each school in his county at least once each term; to organize and conduct teachers' institutes; to advise teachers and school boards as to the best methods of instruction and as to plans for buildings and ventilation; to keep all records, and file all official papers; to call a meeting each year of the district school officers, for the purpose of instruction on their work and duties; to hold examinations for teachers on dates designated by the State Superintendent, and to revoke the certificates issued for cause; and to make an annual report to the State Superintendent.

The organized territory within each county is divided into common, independent, and special school districts. These may be consolidated or divided, by petition and election. For unorganized territory, a county board of education, consisting of the chairman of the board of county commissioners, the county superintendent of schools, and the county treasurer, looks after the educational needs of the children, and levies a tax to provide instruction for them. The county commissioners may, and on petition of 25 per cent of the residents must, appoint a rural school commission of seven, one of whom is the county superintendent, to redistrict the county and form consolidated districts and farm schools. The plan and map are published and submitted to a vote of the people for approval. The annual school meeting is held in July; special meetings may be called; and women may vote at such and hold school offices. Such meetings may elect officers; select sites; build and move buildings; vote money for maintenance; and provide free textbooks. On request of five persons, the question of free textbooks must be voted on. About 90 per cent of the districts provide free textbooks, the remainder selling them to the pupils at cost. Common school districts have a chairman, treasurer, and clerk, elected as such, and independent districts have a board of six directors, who may employ a superintendent of schools. The boards of both forms of districts have power to purchase and sell equipment; lease classrooms; employ and dismiss teachers; provide free textbooks, or sell them at cost to pupils; prescribe rules and regulations for the schools; determine the textbooks and courses of study; admit nonresident pupils; establish and discontinue such grades of schools as are thought best; provide transportation for pupils living more than half a mile from school; contract with adjoining districts for the instruction of pupils; and independent districts may establish kindergartens and evening schools. In common school districts the board submits an estimate of financial needs to the annual meeting for approval, but in independent districts the board determines and levies the tax. Clerks and treasurers may be paid a small sum for their services, and members are paid a *per diem* and mileage to attend the annual county school board convention, called by the county superintendent. The exclusion or segregation of pupils on account of race, color, social position, or nationality is forbidden. All public schools must be free, and taught in the English language, though one hour per day in foreign languages is allowed. The schools are divided into the following grades, or groups: —

(1) High schools: nine months' term; teachers, course, and equipment approved.
(2) Graded schools: nine months' term; four teachers; principal must be a normal school graduate, or must hold a state professional license.
(3) Semi-graded schools: eight months' term; two teachers; principal must hold a first or second-grade certificate.
(4) Consolidated rural schools: —
  (*A*) eighteen or more sections of land; eight months' term; four rooms; principal able to teach agriculture.
  (*B*) eighteen or more sections; eight months' term; three rooms; principal same.
  (*C*) twelve to eighteen sections; eight months' term; two rooms; principal same.
(5) Common schools: —
  (*A*) eight months' term; teacher first-grade certificate.
  (*B*) eight months' term: teacher second-grade certificate.
  (*C*) seven months' term; teacher second-grade certificate.
  (*D*) shorter schools and lower grade certificate.

School Support. — The state originally received 2,969,990 acres of land in the sixteenth and thirty-sixth section grants, about two thirds of which have been sold. The permanent state school fund is now about $20,000,000, and is increasing nearly one million dollars a year from sales of land and timber, mineral leases, and iron royalties. The state one-mill tax for schools produces over $6,000,000, making a total state fund of about $8,000,000 for apportionment. This is about 20 per cent of the cost of the school system. The income on this fund, together with the state one-mill tax, produces a fund of over $2,000,000 a year, which is apportioned to the counties and districts on the basis of a forty days' enrollment in the schools. The amount received in each county from fines, strays, and liquor licenses is added to the fund, before apportioned to the districts. This fund can be used only for teachers' wages, and all districts must raise an equal amount by local taxation. The local taxation consists of a one-mill county tax, but given back to the districts paying it, and local district taxes in addition, as voted. These latter may reach fifteen mills for maintenance, and ten mills for buildings in common districts; up to eight mills for buildings in independent districts; up to nine mills for all purposes in districts of 20,000 to 50,000; and up to eight mills for all purposes in districts of over 50,000.

In addition to the regular state fund and tax Minnesota has gone further perhaps than any other state in the matter of special grants and subsidies for special and desirable educational efforts. A list of these grants, as they were made for the biennium of 1911 and 1912, will show their nature and extent: —

SCHOOL	GRANTS	APPROPRIATIONS, 1911 AND 1912
Regular High Schools	$1750	$320,700
Two year High Schools[1]	$500	
Normal Training Course in	$750	
Agricultural High Schools.[1] Up to	$2500	210,000
Graded Schools	$600	133,600
Semi-graded Schools	$300	160,958
Industrial Courses in high or graded schools[2]	$1000	125,000
Rural Schools[2] uniting for Maintenance	$200	
Consolidated Rural Schools:[2] —	$750, $1000 or $1500	100,000
Consolidated Rural Schools:[2] — New buildings	Up to $1500	
Rural Schools abandoned and pupils transported[2]	$150	
Grants to Common Schools	$50, $100, $150	910,617
Schools in unorganized territory		100,000
Public School Libraries	$10, $20	35,000
Public Schools on Indian Reservations		15,000
Five cents an acre for state land in districts. Up to	$250	50,000
Webster's Dictionaries for schools	$7	4,800
Teachers' Institutes in the counties		27,000
Total Specific Grants for Biennium		$2,192,675

[1] Added in 1909.

[2] Added in 1911.

The total cost of the public school system for maintenance only was about $10,000,000 in 1910.

Educational Conditions. — Educational conditions in Minnesota are very good, for a state so sparsely settled. The state is richly agricultural, with a thrifty agricultural people.

59 per cent of the total population live in country districts, and 25 per cent in the two cities of St. Paul and Minneapolis. In the whole state are only 165 cities and towns with schools of four or more teachers, while among the rural schools of the state 258 enrolled less than 10 pupils, and 1860 less than twenty. 53 per cent of the total population is male, less than one third of 1 per cent are of the colored race, and 73 per cent are native born. The illiteracy is low, being about 4 per cent in 1910. The foreign born are largely Norwegians, Swedes, English and Canadians, and Germans. Marked educational progress has been made during the past decade, particularly along the lines of lengthening the term, eliminating the untrained and weak teacher, the consolidation of schools, and the introduction of agricultural and industrial instruction. The state has good schoolhouses; 85 per cent of the districts have school libraries; and the schools have good equipment. A State Library Board, consisting of the State Superintendent and the presidents of the five state normal schools, publishes lists of books, arranges contract prices, and apportions state aid to the districts of $20 the first year, and $10 thereafter, provided the district raises at least as much. About 100,000 volumes are added to the libraries each year. The inspection carried on by the different state inspectors has had a marked influence for good on the schools. The state has a good compulsory education law, children from eight to eighteen being required to go to school all the time the schools are in session, unless excused for certain specific reasons. In 1911 the excuse of poverty was withdrawn. Any board may appoint a truant officer, maintain a truant school for pupils from eight to sixteen, and may secure commitment of incorrigibles to the state training school. No child under fourteen can be employed in any factory, and not at all during school time. Children over fourteen must have labor certificates. The state labor department is charged with the enforcement of the child labor laws. Since 1909 all deaf and dumb, eight to twenty, must attend the state school, unless provided for in cities or excused for certain statutory reasons. The school term in all the larger schools is from eight to ten months, and averages seven and a quarter months for the state as a whole.

Teachers and Training. — The state employed 15,157 teachers in 1911. Of these 12 per cent were men, 45 per cent were high school graduates, 26 per cent were normal school graduates, and 9 per cent were college graduates. The state aid for schools employing teachers with first or second-grade certificates has done much to eliminate the third-grade certificate, only about 7 per cent of the teachers holding such. In addition to the five large state normal schools at Winona, Mankato, St. Cloud, Duluth, and Moorhead, many high schools offer one year of professional training, following three years of high school work, and the graduates of such a course receive a one-year second-grade certificate. The State Superintendent issues first-grade professional certificates to permanent teachers, on examination or credentials, and second-grade professional certificates on examination. County superintendents issue first and second-grade certificates on examinations or credentials, and third-grade certificates on examination, only when necessary, and these are limited to particular districts and valid for but one year. The examination subjects are graded, and form a continuous series, each examination involving new subjects and broader preparation. Graduates of the state university, who have taken the pedagogical course, and graduates of the normal schools, are granted first-grade certificates. Cities of over 50,000 inhabitants (Minneapolis, St. Paul) may examine their own teachers. Two examinations are held each year; all expenses for such are paid by the state or county, and no fees are charged teachers admitted to them. A teachers' institute of four days is required in each county each year. Summer sessions of four to six weeks are held in each of the state normal schools.

Secondary Education. — Secondary education in the state is well organized, and the number of high schools in the state is increasing very rapidly. In 1895 there were 86; 1900, 115; 1905, 174; and in 1910, 210, with over 21,000 pupils enrolled. There is a State High School Board, composed of the State Superintendent, the president of the state university, the president of the board of normal school directors, *ex officio;* the principal of one high school; and one other, appointed by the Governor. This board looks after the high schools and the graded schools of the state, and has power to prescribe rules and regulations for courses of study, examinations, and conditions for receiving state aid. To represent them, and to act as their agent, they appoint a high school inspector to visit the high schools and a graded school inspector to visit the graded schools each year, and they may ask county superintendents to visit and report to them. The provision for aid and inspection for graded schools (nine months; four departments) is a meritorious feature of the Minnesota state school system. The agricultural high schools, ten of which were authorized in 1909, are another meritorious feature. In 1911 the number authorized was increased to thirty. In 1911 state aid to two-year high schools, and to high schools offering instruction in agriculture and either manual training or home economics, was also authorized.

Higher and Special Education. — The University of Minnesota (*q.v.*), at Minneapolis, a large, important, and rapidly growing institution, opened in 1868, is the culmination of the public school system of the state. The state also maintains, under the direction and control of the University Regents, state schools of agriculture at Crookstown and Morris, a sub-agricultural station at Grand Rapids, and an agricultural high school at the university. (See AGRICULTURAL HIGH SCHOOLS.) In addition to these institutions, the following colleges offer higher instruction: —

INSTITUTION	LOCATION	OP'D	CONTROL	FOR
Hamline University	St. Paul	1854	M.E.	Both sexes
St. John's University	Collegeville	1857	R.C.	Men
Gustavus Adolphus College .	St. Peter	1862	Luth.	Both sexes
Carleton College	Northfield	1867	Nonsect.	Both sexes
Augsburg Seminary	Minneapolis	1869	Luth.	Men Both sexes
St. Olaf College	Northfield	1874	Luth.	
Albert Lea College	Albert Lea	1884	Presby.	Women
Macalester . .	St. Paul	1885	Presby.	Both sexes
Parker	Winnebago	1888	Free Bap.	Both sexes

The state also maintains a number of institutions for the training of defectives. These are: the State Training School for Boys and Girls (reformatory), at Red Wing; the State Reformatory at St. Cloud; the Minnesota School for the Blind, at Faribault; the Minnesota School for the Deaf, at Faribault; and the Minnesota School for Feeble-Minded and Colony for Epileptics, at Faribault. E. P. C.

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GREER, JOHN N. *History of Education in Minnesota*, (*Circ. Inf. U. S. Bu. Educ.*, No. 2, 1902.)
KIEHLE, D. L. *Education in Minnesota.* (Minneapolis, 1903.)
Minnesota, *State Constitution*, 1858.
Laws Relating to Schools and Education, 1911 ed.
Reports of the Supt. Publ. Instr., annual 1868–1878; biennial 1880–date.

MINNESOTA, UNIVERSITY OF, MINNEAPOLIS AND ST. PAUL, MINN. — A coeducational institution established in 1851. A preparatory school was conducted until the financial panic of 1857. After a period of difficulties, a reorganization was effected in 1868, and collegiate instruction was begun in 1869 under President Folwell. The university was given lands for the support of a college of agriculture, and was empowered to organize other colleges and schools. President Folwell fostered practical agricultural education, organized the geological and natural history survey (1872) in organic connection with the university, and secured the establishment in 1878 of high schools receiving state aid in consideration of their preparing students for the university. The university thus became actually as well as nominally the head of the state system of education. Under the administration of President Cyrus Northrop (1884–1911) the following colleges and schools were organized: engineering and mechanic arts in 1885, medicine and surgery, homeopathic medicine (discontinued in 1909), dentistry and law in 1888, mines in 1889, pharmacy in 1892, analytical and applied chemistry in 1903, graduate school and college of education in 1905, forestry and training school for nurses in 1909. The work in agriculture has developed until it includes a college, school, short courses for farmers and teachers, an experiment station at the university, and three schools of agriculture and two experiment stations at other points in the state. The college of forestry has extensive forest lands near Lake Itasca for practical work. In 1911 Dr. George Edgar Vincent succeeded Dr. Northrop as president of the university.

Prior to 1884 more than $300,000 had been invested in farms, campus, buildings, and equipment. By the year 1906 this had increased to nearly $2,000,000, and by 1911 to about $6,000,000. The university has received from private benefactions about $550,000. Since 1907 the campus has been increased from about 53 acres to about 120 acres at an expense of $841,000, and the sums made available by legislative appropriation for the years 1908 to 1913 for the purpose of new buildings, equipment, and other permanent improvements amount to over $4,000,000. The university is supported by funds received from the federal government, by legislative appropriations and the proceeds of a .23 mill tax from the state, by interest on invested proceeds of land sales, and by students' fees. The annual budget for current expenses for the year 1911–1912 shows a total income of $1,410,000. The university still retains a large part of the lands granted for its support, and much of this land contains valuable ore deposits. The endowment ultimately to be derived from these ore lands can scarcely be estimated at present — certainly several millions of dollars. The university occupies twenty-five buildings on the university campus, twenty-nine buildings at the university farm, and thirty-three buildings at the other agricultural schools and experiment stations. There are under construction six buildings on the university campus and ten buildings at the college and schools of agriculture.

There is required for admission to the colleges of science, literature and arts, agriculture, engineering, dentistry, mines, pharmacy, chemistry, forestry, and nurses' training school, a four years' high school course (fifteen units), including certain specified subjects. The colleges of medicine, law, and education require two years of college work for entrance.

The length of the courses of study in the several colleges is as follows: education, two years; dentistry, law, and nurses' training school, three years; science, literature and arts, agriculture, chemistry, forestry, mines, and pharmacy, four years; medicine and engineering, five years. The college of medicine requires one year of satisfactory service as hospital interne before granting the M.D. degree. The usual degrees for undergraduate and graduate work are conferred by the university.

The enrollment of students of collegiate grade in 1911–1912 was 4073, of whom 311 were in the summer school. Students in agricultural schools, 1322, of whom 186 were at Crookston and Morris. Correspondence and extension courses, 306. Total enrollment, 5701. The faculties at Minneapolis and St. Paul consist of 418 professors and instructors and 104 assistants, at Crookston and Morris, 22 instructors; total, 544 members. J. B. J.

MINSHEU, JOHN. — A teacher of languages and writer of a polyglot dictionary in 1617. He edited and enlarged R. Percyvall's *Dictionary* in Spanish and English in 1599 (and 1623), and augmented Percyvall's Spanish Grammar in 1599. His polyglot dictionary is entitled Ἡγεμὼν εἰς τὰς Γλώσσας, *id est, Ductor in Linguas. The Guide into Tongues.* Originally there were eleven languages: English, Welsh, Low Dutch, High Dutch, French, Italian, Spanish, Portuguese, Latin, Greek, Hebrew. These are given together for the sake of comparison. In his address to the reader he enumerated the various gentlemen who had assisted him in undertaking his great work, and prefixed to the *Dictionary* a catalogue of subscribers for the volume, headed by the King (James I), the Queen, and the Prince — the first instance of a book containing such a list. Published in the year following Shakespeare's death, it is of special value as containing the most representative names of book-buyers in England. F. W.

Reference: —

Dictionary of National Biography.

MIQUELON. — See French Colonies, Education in.

MIRABEAU, GABRIEL HONORÉ RIQUETI, COMTE DE (1749–1790). —French author, orator, and statesman. His chief interest in the field of education is indicated by four speeches published posthumously by his friend Cabanis under the title: *Travail sur l'Education publique trouvé dans les Papiers de Mirabeau l'ainé* (Paris, 1791). In one of these he advocated the abolition of the three French academies (later done by the Convention, 1793), to be replaced by a single national academy. A rather elaborately worked out plan of educational organization recognized the following as essential factors in the scheme: (1) academies (*i.e.* learned societies); (2) colleges and public schools; (3) medical schools; (4) the theater; (5) museums, botanical gardens, and public libraries. This never got beyond the stage of a " proposed " bill, but it merits note among the educational activities of the revolutionary period. His works were published in nine volumes (*Œuvres*, Paris, 1825–1827). F. E. F.

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Mémoires de Mirabeau écrits par lui-même, par son Père, son Oncle, et son Fils adoptif. Introd. by Victor Hugo. (Brussels, 1834–1836.)

Warwick, C. F. *Mirabeau and the French Revolution.* (Philadelphia, 1905.)

Willert, P. F. *Mirabeau.* (London, 1898.)

MIRROR WRITING. — Writing which would appear like normal writing if seen in a mirror. Such writing as this very frequently appears in abnormal cases. It is readily produced by a normal individual by taking a pencil in his left hand, and moving this hand freely without special effort to control the direction of its movements while he writes with the right hand. Certain persons when hypnotized produce mirror writing with the right hand. The whole matter is of importance to the teacher because certain children exhibit a tendency to produce mirror writing in the early years of their training. Such a tendency of the young child may be due to the fact that a child is extremely left-handed. When he is forced to write with his right hand, he sometimes inverts the order of the movements as a normal individual inverts these movements in the experiment of tracing with his left hand. The teacher will very frequently regard a child as utterly incompetent to form letters because the regular form of the movements is overlooked on account of their inverted character; where such cases arise, it is usually best to make some concession to the left-handed character of the child's organization. C. H. J.

See Ambidexterity; Writing.

MISSIONS, THE EDUCATIONAL ASPECT OF MODERN. — Modern missions began with the last century. The charters of the missionary societies organized at that time and for fifty years afterward contained little or no allusion to educational work. The purpose of the missionary endeavor was set forth in the general statement, " to preach the Gospel to the heathen nations." An occasional charter refers to the translation of the Scriptures into the languages of the East as indicating a part of the work the missionary society was set to accomplish, but in none of these earlier charters was there revealed any purpose to plant systems of education in the East. It is equally apparent that when the earlier missionaries reached their widely separate fields they quickly saw the necessity of beginning some kind of educational operations, and schools of low grade were among the first reported results of missionary labor. The fact that this method of approach was adopted by practically all of the earlier missionaries indicates a general practical need for educational work as a foundation for the missionary enterprise. As in most instances the early schools established by the missionaries were the only educational institutions in the country, they were naturally of the most primitive grade. In reporting the schools thus started, emphasis was laid by the missionaries, not upon their educational value, but upon the approach to the people that the schools afforded, and also upon the fact that through these schools natives were being trained to become missionaries' helpers.

It is not within the province of this article to record the development of the mission school, but it should be recognized that as a natural and inevitable result the grade of mission schools was lifted until there were developed special forms of education, as ministerial training for selected young men and a more general line of education with emphasis upon languages, history, geography, and mathematics, for the preparation of teachers. It was inevitable, however, that the school should experience a larger degree of development, especially in countries like India and Turkey, where there was a strong desire on the part of the people for a higher education for their children.

Another stimulus to the development of the educational work of missions was the fact that so many of the missionaries had received college education and were naturally appreciative of the value of such a discipline in the new society which they were endeavoring to establish throughout the mission fields. These saw the necessity of thoroughly educated men and women to hold positions of leadership, not only in what are called the learned professions, but in all departments of business. At the same time the mission plan involved the development of the Christian Church as an institution developed within the East, with Eastern funds and under Eastern leadership, itself aggressively extending Christianity in the country in which it was established. It required no argument for these men and women, themselves the product of the highest education given in England and America, to realize that such an Eastern Church must have as its leaders men and women of the broadest intellectual training. This fact was emphasized when attention was called to the defective educational systems already existing in China, India, Japan, and other countries, which, although inadequate to prepare men for modern life, nevertheless possessed great disciplinary values. It was evident that if the Church of Christ, which the missionaries were attempting to develop throughout the East, was ever to become a recognized force and assume a place of leadership, it must be through the wide dissemination, among the Christians at least, of general education, including even that of collegiate grade and rank.

Another important factor in the development of missionary education, particularly that carried on by missionaries from England and America, was the introduction of the study of English. In most of these countries at the beginning of the last century there was no educational literature, and it could hardly be expected that the missionaries would ever be able to produce a modern scientific literature in the vernaculars of the various countries where they were carrying on work sufficient to meet the demands of the higher educational institutions into which their intermediate and boarding and high schools were bound to develop. They did create a literature for the primary and intermediate schools which was measurably adequate, but the task of doing the same for the colleges was practically too great to be undertaken.

At the same time, as the earlier missionaries represented for the most part the English speaking world, and as the countries from which they came were recognized by the people as of leading political and commercial influence, it was but natural that there would be a general desire on the part of the young men, at least in mission collegiate institutions, and even in high schools, to study English. In India a knowledge of the English language opened a career under the East India Company, and later under the British government, for any Indian young man; the same was true of Burma and Ceylon. Moreover, in other countries, not officially connected with English-speaking nations, there was soon developed the opinion that English was a modern classical language, the language of the great commercial nations of the world, and that the mastery of that tongue would be of financial as well as intellectual value to their young men.

From 1855 to 1875 there was a reaction on the part of some missionary societies against higher educational work in mission institutions, and especially against the teaching of the natives through the medium of Western languages. This department of mission effort had not made the same progress in German and Scandinavian societies that had been made by English-speaking societies. There was at that time much discussion among the home societies and their constituency as to the place of higher education in missionary work. While in not a few instances the decision in the councils of the home societies was against the further development of higher educational work on the mission field, under the direction of the missionaries this work was gradually and persistently enlarged, until during the last quarter of that century, mission boarding and high schools in no small number began to assume the rank and do the work of collegiate institutions. It should be stated that in the meantime the conservative constituency at home began to realize the place that education must take in the planting of permanent Christian institutions in the East, and opposition rapidly diminished until it has now practically disappeared.

Among the Roman Catholics quite another set of problems presented themselves. Their schools were not as democratic and general as those of the Protestants, but were regarded more as church schools, and were maintained within and for the Church.

The Aim of Mission Schools.—In creating a system of education in the mission field the endeavor has been made from the beginning so to develop the work that it shall belong to the country and not have the appearance of being a foreign educational system imposed upon the country. The teachers in most primary schools, apart from the heads of kindergartens, are natives. The same is practically true in the boarding and high schools, except that occasionally the head of the school, for the present at least, is a missionary. It is not expected, however, that the foreigner will hold permanent control.

In collegiate institutions the great majority of the teachers are natives of the country. In some of these the president is a native, with missionaries working under him, as in the Doshisha in Japan. Even in the theological schools in mission fields, native teachers are employed. It is probably true that the foreigner will keep his hand upon the collegiate and theological institutions longer by far than upon the other schools of the country; how long he will continue to hold dominating influence will depend upon the rapidity with which the country itself develops in moral and educational ability and the native leaders show themselves capable of assuming the larger Christian responsibility. The general policy, however, of mission institutions in this respect has been from the first, and still is, to develop native talent as rapidly as possible and to employ that talent in the educational work.

Support of Mission Schools. — Another phase of this work is the development of self-support. It was early learned by the missionaries that free schools were practically valueless. The Asiatic appreciates that for which he pays something, but is liable to look almost with disdain upon that which costs him nothing. No free school can expect to command the regular attendance of its pupils. There are probably no schools in the world that come nearer to self-support through the tuition paid by pupils than do many of the mission schools of the East. In fact, large numbers of these schools are wholly self-supporting, although still retaining their relations to the mission. Even the collegiate institutions, in some countries like Turkey, secure from the pupils themselves in the form of fees or tuition from three-fourths to five sixths, or even a larger ratio of the cost of the conduct of the schools. The development of self-support has not been so marked in India because of the greater poverty of the class of people who make up the student clientèle. So long as Americans and Europeans remain in any appreciable number as teachers in the mission colleges and universities, financial help from abroad will be necessary for their conduct.

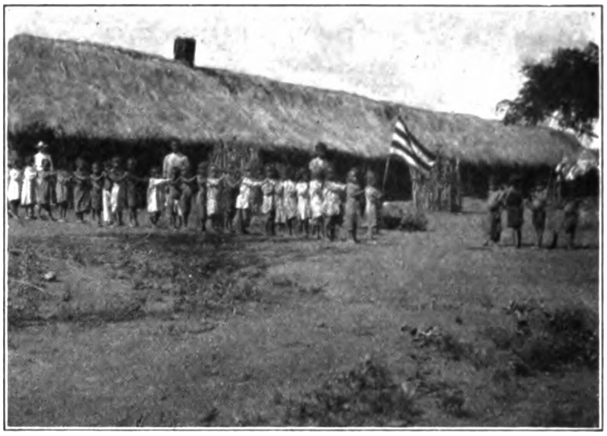
The Character of Mission Schools. — Missionary education has been handicapped for the lack of a model or precedent; the whole plan of education had to be wrought out by the missionaries through long and protracted experiments in each country. Each different country presented new problems to be met and solved. At the same time few of the missionaries had received scientific pedagogical training. Large numbers had full collegiate training, but with no special reference to the teaching profession. Many missionaries went to the field expecting to engage only in evangelistic enterprises, but soon found themselves in charge of a large educational work.

It is no wonder then that the development of the missionary educational system, if it could be called a system, was irregular and often unscientific. The hindrances already named were enhanced by the fact that the man who was at the head of a high school, college, or even university was seldom able to give his entire time and strength to that work. Recognizing also that missionary educational efforts from the beginning have been curtailed for the want of proper financial support, we begin to realize some of the limitations under which this work has been developed. There is hardly a mission school to-day that is properly equipped. In the marked educational advance of countries like Japan the missionary schools are rapidly left behind. The Eastern governments, becoming alert to the value of modern education, are able to appropriate funds for the erection of buildings and for their equipment, far superior to those of any mission plant. China is making rapid progress in this line at the present time, and even the Turkish Empire, under the new régime, is appropriating large sums of money for developing a national educational system.

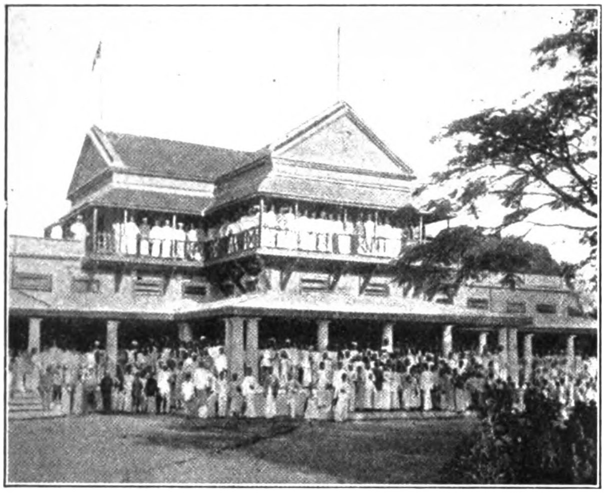
Notwithstanding that missionary work is so defective in equipment and in skilled leadership, the fact remains that the mission schools in most of these countries have been the models which have demonstrated to the officials of the country what can be done in the line of modern education, while, at the same time, they have awakened ambition in the hearts of the people for education. Moreover, though far surpassing the missionary institutions in equipment, in many places the government schools are not popular, because of inability to secure teachers able to command the confidence of the parents and pupils.

Courses of Instruction. — It is impossible within the limits of this article to give any adequate conception of the courses of study offered in the higher collegiate missionary institutions. In each case and in every country the missionary college offers a curriculum that places it among the first educational institu-

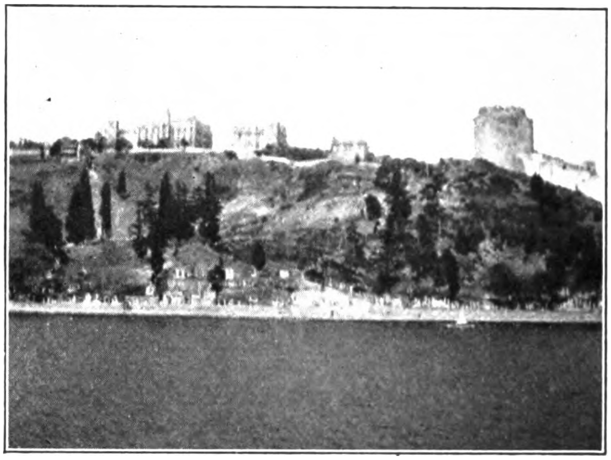
St. John's College, Shanghai, China.



An Elementary School in Africa.



Reid Christian College, Lucknow, India.



Robert College, Constantinople.

Baptist College, Rangoon, Burma.

A Mission School for Girls in Japan.

TYPICAL MISSIONARY EDUCATIONAL INSTITUTIONS.

tions of the land. This position is held by nearly all of the so-called mission colleges, although at present in Japan the national universities are in advance of the missionary college, and it is expected that the students of the missionary college, to complete their course, will go to the university. In each country the endeavor is made to adapt the course of instruction to the needs of the country. In no instance has the American or English curriculum been transported bodily to the East. Less emphasis is laid upon the dead languages, and more emphasis upon spoken tongues, especially English, French, and German.

The sciences, which were at first indifferently taught, are receiving more emphasis as the East is developing. Special stress is laid upon the history of Western nations, upon the science of government, economics, etc., all of which are demanded. At the present time there is an unusual demand for the sciences and the development of technical training. How far missionary societies will be able to respond to this call remains to be seen. To meet this demand the universities' missions are coming to the front.

It should also be understood that all of the mission colleges put emphasis upon the training of the stable moral character. This statement applies to all of the mission schools, beginning with the kindergarten and primary school. The development of character is fundamental in the ideas of the missionaries and the societies backing them, and emphasis upon this point is not lacking even in institutions not especially labeled as missionary, but which have grown out of the missionary educational system.

The Protestant mission schools, with few exceptions, have no religious tests for admission or for graduation. In most of the schools the fundamental truths of Christianity and the principles that underlie it, as well as something of an outline of the history of its development and the growth of the Christian Church, have place in the regular instruction given. Every pupil is left free to adhere to the religion of his fathers, without loss of standing in the school and without sacrifice of any of its privileges.

Female Education. — There is probably no department of missionary education which is more fundamentally important than that dealing with the education of girls. In nearly every country where the missionaries have started schools there was not only an immemorial custom, but a deep-seated and fundamental prejudice against the advance of woman, and in most of these countries it was a matter of belief that women were incapable of intellectual improvement. In some places the idea that a woman could learn to read was hardly to be entertained; but the still more advanced idea that she should be educated was regarded as preposterous.

In the face of this handicap, the missionaries began in a modest way to educate girls, in the face often of open and violent opposition. It has been a matter of surprise to the missionaries themselves that this opposition has so completely disappeared. Girls' schools in many of the mission fields are among the most popular of missionary institutions, and many an Oriental parent is paying handsomely for the education of his daughters. While Japan has made marvelous progress in adopting an educational system for the empire, she has not made the same development in girls' schools as in those for young men; and even to-day it has been stated on what seems to be good authority that the mission collegiate institutions for young women are superior to the government institutions for girls.

The girls' schools, at first of the humblest character, have developed, as have the schools for boys, and have proven to the people beyond any possibility of doubt, not only that girls are capable of intellectual discipline and development, but that there is a place in Oriental society for the educated woman. These school systems have developed into colleges for young women, some of which have already gained international repute, like the American College for Girls in Constantinople, and other institutions in Turkey of similar character, as well as colleges for girls in India, China, and Japan. While the courses of study in these colleges are not yet quite up to the grade of corresponding institutions for men, yet they do not lag far behind. They are all thoroughly abreast of local conditions, and are preparing women for positions of marked influence and leadership. The graduates of these schools have open to them the teaching profession, and the demand even from government institutions for teachers is far greater than the mission schools can supply.

As a natural result of the elevation of womanhood through these schools of the East, we find that the young men who are graduates from higher institutions of learning are eager to secure wives who have had a higher course of instruction. About one third of all the pupils in the mission schools of the world are girls and young women. This fact demonstrates the place which these schools already hold and the influence they exert.

Classification of Schools. — Departmental classifications of mission schools have been most unscientific in all countries, and without uniformity throughout the world. The fact that every missionary society prosecuting work for any length of time in a single country has felt it necessary to take up some form of educational work is a clear indication that, in the judgment at least of the workers on the ground and the societies at home, permanent missionary institutions cannot be established in any country without their being embodied in some form of general education.

The first educational work undertaken by the missionaries was elementary.

Primary or Village Schools. — Even during the first modern missionary generation the primary school held an important place. The first work the missionaries could do, even while they were learning the language of the people. and, in fact, as one of the most effective ways of securing a working knowledge of the vernacular, was to gather groups of children together into rude schools. If there was a literature of the land, the children were taught to read that literature; if, as in the case of many of the peoples of Africa and the islands of the Pacific, their own vernacular had no written character, the children were taught the characters which the missionaries created and the grammar of the language which they made, and thus education in the vernacular commenced.

The village or primary school, however, has become one of the institutions of missionary effort, and lies at the foundation of the educational work carried on in all countries. In these schools are gathered by far the largest number of the pupils under missionary instruction. Most of these lowest schools are not carefully and thoroughly organized. In no single country can the missionary primary educational work be called a "system," as there is little or no relation between the schools carried on by one mission board and the schools even in near regions carried on by another missionary organization. While there is lack of systematic coöperation in primary educational work, essentially the same things are taught in all these schools, *viz.* training in writing and reading the vernacular, with a smattering of number work and a little geography and history, with stories about foreign countries and the Bible. In some countries, and by some mission boards, English, German, or French is taught even in the lower grades.

It can be laid down as a fact that wherever the modern missionary has gone and among whatever people he labors, there have been organized under his direction widely extended common village schools for both boys and girls. These, for the most part, were at the beginning and still are the only schools of the kind in the country, and furnish the only rudimentary education afforded the children of that country. The teachers in these schools are natives, who in turn have received their training in the higher schools more directly under the missionary. The missionary has general charge of the primary educational system, and, in many cases, the expense of the school is paid in whole or in part by the people themselves in the form of tuition. This statement does not apply to Japan and some other countries, since the governments of Japan and a few other nations have themselves developed a comprehensive primary educational system which has made it unnecessary for the missionary to give time and strength and to spend money on this line of work.

The primary and village schools now carried on by Protestant missionaries alone number nearly 29,000, and they have an attendance of over 730,000 pupils, of whom nearly one third are girls. In each instance it is in these schools that children receive the first rudiments of an education and get their first ambition to advance in an intellectual course. The most of these schools are in rural regions, away from centers of influence and action, but among some of the most virile populations.

The Roman Catholics were in some respects the pioneers in the prosecution of primary education. In schools organized and conducted by them among non-Christian races they have a primary school population under their direction and control numbering 841,000. This gives a total of children in non-Christian countries studying in Christian mission schools in the primary grade of 1,571,000, but few of whom would have had any school privileges had it not been for the missionary.

Kindergartens. — The kindergarten was introduced into Asia by missionaries. It is a comparatively new method of education in the Nearer and the Farther East. Missionaries introduced the first kindergarten into Japan and prepared the first kindergarten literature, but the Japanese government has now adopted this method of training. It is proving to be one of the most popular methods of education that the missionaries have introduced into any country, attractive to parents and receiving general favor from government officials. In India the government gives subsidies for well conducted kindergartens. The Chinese are showing unusual interest in kindergarten training; and in Turkey parents are eager to have their children come into the developing and suggestive atmosphere of the kindergarten. The kindergarten holds a different place in missionary education from that occupied by the common village school. In the latter, for the most part, pupils are gathered from the lower strata of society, while the kindergarten has the patronage of the higher classes and thus brings the missionary educational system closer to the palace. The kindergarten has not yet been widely introduced in any country abroad. Only the more advanced of the Eastern peoples have yet been offered this method of child-instruction. There are as yet only about 5000 children in the Protestant missionary kindergartens, while the Roman Catholics seem to have given little or no attention to this type of education.

Intermediate and High Schools. — During the first missionary century in this modern era, practically all of the education carried on by missionaries was of the primary character. It was inevitable, however, that in the awakening of the East, education could not be kept down to primary grade, and that steady advance should be made until the primary and village school grew into the intermediate school, which, in turn, developed into the high school. This statement should not give the impression that the missionaries had a well developed school system, in which pupils passed readily and systematically from one grade to another. It is not uncommon even to-day to find under a single roof, occupying the same classroom, and studying side by side, students of primary and of high school grade, with all gradations between.

At the same time it should be recognized that the desire for education on the part of the people themselves, coöperating with the need of the missionaries for trained native workers, led to the development of the educational system at the larger centers of population until there came to be well-defined schools, which, in the ordinary classification, would be called high schools. These did not fit for college or have a uniform course of study, but they were the schools giving the highest and most extensive training to both young men and young women in the country, and would compare favorably with even some collegiate institutions in the United States, two hundred and fifty years ago. In the Protestant mission schools in Africa and the East, of intermediate and high school grade, including mission boarding schools referred to under another heading, there are now studying 165,500, of whom about 60,000 are girls and young women, while the Roman Catholics have an attendance in schools of a similar class of 156,000. This makes a total of students studying in mission intermediate, boarding, and high schools for both sexes and in all countries of 321,000.

Boarding Schools. — The missionary boarding school might almost be classed under the name of high school, but having characteristics peculiar to itself, it fills a place of such great importance in the work of missionary education among Eastern races that it should receive special mention. The missionary boarding school is probably the poorest classified and organized school which can be named. Under modern development it has become much better organized than a few years ago, but the basis of classification in the boarding school is the pupil, and not his studies or age. In most of these schools pupils are gathered from outlying districts and kept in the school home, which may well be compared to the old New England academy. The emphasis, from the missionary standpoint, is placed upon the Christian character of the home into which the pupils are gathered, and not upon the courses of study or the scientific character of the instruction given. It is from these schools both for boys and girls that the missionary secures teachers for the lower schools and the best native missionary workers. Statistics were given under the preceding subject.

Normal Schools. — The normal school is one of the later developments of the missionary educational system. It is only in recent years that the missionaries have been conscious of the necessity of having more scientifically trained teachers. Even at the present time, however, the missionary normal schools are woefully deficient. Few indeed have come up to grade, but it should be said that an earnest endeavor is now being made to put normal instruction upon a better basis. In some countries the missionaries of various denominations are uniting in the development of a normal school that is worthy of the work to be done. Missionaries are securing for themselves special pedagogical training, with a view to giving more attention to normal school education. This advance has been made under the stress of the need and the pressure of the governments where the schools are. India, for instance, is demanding a better grade of teachers for the primary schools that receive grants-in-aid from the government. The same is true of Ceylon, and it will undoubtedly be true soon of China and of Turkey.

It is strange that the normal school has not had earlier and more complete development. It is expected that this phase of missionary work will henceforth develop more rapidly, and that the missionary schools will be called upon much more than in the past to provide teachers for the governments, and that they will be copied more as models for the development of national institutions. It is impossible to secure accurate statistics regarding the number of pupils under normal training in mission schools, since in most cases instruction in this department is given in collegiate and training schools to special classes, of which separate records are not kept.

In probably a majority of the mission boarding schools for girls, domestic economy is taught. This is not the domestic economy of Occidental life, but of the life of the pupils among whom the school is established and for whom it works. Attempt is made to avoid training the girls into ways of living that will not be in harmony with their life after graduation. It was once thought necessary to introduce Western ways into Asiatic schools and to teach these ways to the pupils; but wiser counsels are now prevailing. The girls in boarding schools, as, for instance, in India, are taught to prepare the foods of India with Indian apparatus, and to serve these foods in the best possible way with the equipment an Indian kitchen affords. In most of the boarding schools each pupil is expected to have a share in the domestic economy of the institution, under wise and competent teachers, so that when she completes her course she will carry to her home the highest domestic skill to be found in the country.

In some instances, where it is expected that pupils will be brought into contact in their after life with people of the West, or where it is anticipated that Western customs will prevail more or less in their homes, Western phases of domestic economy are introduced into the school; as, for instance, in great centers like Tokyo, Bombay, and Constantinople, certain girls are taught the domestic economy of the West, which consists of the preparation of Western food in a Western way and the serving of those foods at a table as it would be served in Europe or the United States. At the same time, the pupil is taught to sit at the table and to carry herself in a way that would be acceptable in good society in the West.

This phase of domestic economy is not widely extended, but it is important, since not a few of the graduates of these institutions, especially the girls' colleges, become wives of professional men who either themselves go to America or to Europe with their wives or are called upon to entertain Western men of note in their homes. In all such cases a knowledge of Western customs is of great value. But for the most part the domestic economy taught in the mission schools is that of the country wherein they are located.

Collegiate Institutions. — The missionary colleges were in many instances the first institutions of higher learning to be developed in the countries in which they exist to-day. This statement is true of Turkey, Persia, Bulgaria, India, Burma, Ceylon, Korea, and Africa, and, viewed from a Western standpoint, of China and Japan. They were the natural outgrowth of the village school, and have come into existence at the demand of the people for modern Western education, accompanied by the need in missionary work for thoroughly trained native leaders. It is this requirement of the missionary work, together with the aspirations of those who sought an education for its own sake and for what it would bring to them in the way of advancement, that has made the missionary college a significant institution in the East to-day. It must be remembered that many high schools, and even ordinary boarding schools under missionary direction, have been given the name "college." This weakness, on the part of certain missionaries, for a high-sounding name has brought discredit, in some countries, upon the missionary college. At the same time it cannot be denied that missionary colleges have been, in most cases, the foremost institutions for higher Western learning in the countries where they have been established; and in lands like Turkey, Africa, India, Ceylon, Burma, China, and Korea they stand without a rival. The development of missionary colleges within the last generation has been rapid. In 1850 there was hardly a missionary school that bore the name "college." The real collegiate movement began in the last quarter of the last century. The development of the college is quite parallel with the awakening of the Asiatic races, and may be regarded as a part of that awakening.

The courses of study in these colleges are on a par with the curricula of the ordinary colleges of the United States and Canada, and many of the denominational colleges of Great Britain. Not so much emphasis is put upon the dead languages as upon the living, and in all these institutions the native tongue of the missionary in charge is made the principal foreign tongue; as, for instance, in the French missionary colleges, French is the principal foreign language; in the German colleges, German, and in the English colleges, English.

These institutions have been most satisfactorily patronized by the people. They are more largely self-supporting, because of the heavy tuitions the people themselves pay, than are similar institutions in America and Europe. It has been currently reported that the American colleges in Turkey, all of which have grown out of the missionary work there, have had unusual influence in shaping the new Turkish Empire and in preparing the minds of the people for constitutional government. It would be impossible to overestimate the place which the missionary colleges to-day hold in the great national movements of the East and the influence which they exert over the minds of the young men and young women coming forward rapidly to positions of leadership among these awakening nations. These colleges have formed the model upon which private and national collegiate institutions have been created.

More than 25,000 of the brightest young men and women in the Nearer and the Farther East are to-day receiving a thorough higher education in the collegiate and training institutions which Protestant missionaries have established, and which directly or indirectly they sustain. This means the graduation of some 4000 young men and women each year to take positions of commanding influence among their own people. The Catholic missionaries furnish no distinct statistics covering this grade of work.

Medical Colleges. — The medical college is an outgrowth of the medical as well as of the general educational missionary work. Even to the present time there have been not a large number of medical colleges established in mission fields, but a few of these are of a high order and rapidly developing, as, for instance, the Medical College at Pekin, China, in which six different organizations unite and which is already recognized by the imperial government; also the Syrian Protestant Medical College at Beirut in northern Syria. In China, in India, and in Turkey, as well as many other of the Eastern countries, the first modern scientific medical education provided for young men has been given through the missionary medical college and by the medical missionary in the form of personal instruction to native assistants. There are some 1000 students in the distinctly Protestant missionary medical colleges, besides medical missionary assistants and nurses numbering several thousands. The Roman Catholics furnish no statistics.

Industrial Schools. — Industrial schools are the least systematized and the poorest developed of any of the educational institutions connected with missionary work. They are probably the least scientifically conducted. The first idea of the industrial mission school grew out of a desire to provide for needy pupils some means by which they might earn a part, at least, of their own support, while securing an education. For that purpose industries were introduced with the main object of furnishing food and clothing for the students practicing them. This was followed by the idea of teaching pupils some trade by which they might earn their livelihood after they had finished their education. The necessity for this vocational training grew out of the persecution which the Christian student often received and which handicapped him in industrial competition. This part of missionary work has not, on the whole, proved a success. Missionaries have not shown themselves capable of teaching trades to Asiatic young men by which they may earn a livelihood after going out into the world. Instances are comparatively few where students graduating from an industrial school have successfully pursued the trade studied in the school.

At the present time industrial work is taking a somewhat modified form, and will probably be widely developed along this line; namely, to teach the pupil to use the tools of his country and produce that which the people themselves require, and to do it at a price that will make it possible for him to live thereby. Altogether too many of the industrial schools have taught the pupils to produce goods which could not be sold except in a foreign market and through the missionary agency. One thing has been accomplished by all these forms of industrial work; namely, the pupils have been taught the dignity of labor, and their minds have been dispossessed of the false impression so prevalent in the East that a scholar must not do manual labor. The results in this direction have been most beneficial.

There is an independent line of industrial work for women which needs to be mentioned. This consists largely of lace making and needlework, and has been, in large part, for the purpose of furnishing them a means of livelihood. The results have been most satisfactory in that widows and others who without this would be beggars upon the street or something worse, have become self-respecting and independent, earning their living by the skill and labor of their hands. Industrial work of this kind on a large scale has been carried on, as, for instance, by Miss Shattuck at Oorfa, where thousands of widows and orphans were provided an opportunity to earn their living when Turkish massacres had cut off their every source of support.

The Roman Catholic missionaries do not publish reports of their industrial operations, although they are not behind the Protestant societies in teaching the dignity of labor and self-help and in instructing their pupils in various handicrafts. In Africa the demand for a fuller development of this line of instruction is on the increase.

Technical Schools. — The missionary technical school has not been widely developed, although at the present time the call is growing louder for the enlargement of this phase of collegiate education. The reason for slow development has been, without doubt, the great cost of the technical school as compared with the ordinary college. The colleges themselves have been poorly equipped, and the most of them are meagerly supplied with apparatus and with a proper teaching force. The demand for such technical schools in India, China, and Turkey is now insistent. It is probable that in China, as in Japan, the government will soon provide for this line of education. Few missionary societies will feel able to make the necessary outlay of money for the establishment of adequately equipped plants for full technical education.

Theological Schools. — The theological school has been a natural outgrowth of missionary work, and has for its object the training of Christian leaders for the newly organized churches and for general evangelistic work in the field. The purpose of the theological school is to train up natives of the country who will themselves bear the burden of the work which the missionaries at first bore, and to lead the native church into independence and self-support. These schools have been in many instances rude, and the development has not kept pace with the development of the missionary colleges and other educational institutions. About 12,000 Protestant young men in mission countries are now pursuing courses of instruction in preparation for the pastorate of native churches and for general religious leadership. Again we are provided with no statistics for Roman Catholic missions.

Agricultural Institutions. — In many different sections of the mission field, missionaries have done not a little to improve the agricultural conditions of the country by securing land and training young men connected with their schools in scientific methods of tilling the soil and raising crops. This phase of missionary work has never received much attention, although not a little has been done by the missionaries in many countries in introducing, through this line of education, better implements of agriculture and more scientific methods of farming as well as new seeds and vegetables from the West. There is at the present time much call in many mission countries for the establishment of agricultural schools. Plans are already being developed to have an agricultural department connected with some of the existing missionary colleges. This work is eagerly desired by the people, and, if properly guided, would be of infinite value in raising the productive power of land as well as in increasing the quality of agricultural products.

Schools for the Blind. — The early loss of sight is probably one of the greatest afflictions of the East, but until Christian work began little or nothing was done for the blind. The missionaries have opened schools for the blind in many of the great mission centers. They have secured the printing of books for the blind in the languages of the country, and have opened schools in which blind children are taught not only to read, but to become self-supporting through the practice of some handicraft suited to their condition. These schools have made profound impression upon the people of the country, and are changing their attitude toward the helpless blind in a way that was not contemplated.

Something of the same line of work has been opened in many places for the deaf and dumb, and with similar results. This work as yet is not very extensive, but it has led, as in Japan, to calling the attention of the government to the necessity of doing something for this class of their citizens.

In Protestant schools for the blind and for the deaf and dumb there are 844 children under special instruction. The Roman Catholic figures make no report of these departments of training. This is one of the new lines of mission work, and probably as resources increase it will be rapidly developed.

Orphanages. — There are few missionary societies that have not at one time or another in their history opened schools for orphans, which have been practically orphanages pure and simple, but with provision for the intellectual as well as physical and industrial training of the children brought into them. The Roman Catholics have done more in this direction than have the Protestants. As a general thing the Protestant missionary societies have not regarded this as a permanent part of their work; but in countries which have suffered severe scourges of plague, famine, or massacre, it has been impossible for the missionaries to remain in the country and not open refuges for the reception of the great numbers of orphan children left absolutely without protection.

It was under such an impulse as this that the Protestant orphanages, for the most part, were opened. It was necessary to continue the work at least until that generation of orphans had received their training and had been placed in positions where they could become self-respecting, self-supporting members of society. The massacres at different times in Bulgaria and Turkey and the plagues and famines that have afflicted India in the not remote past have led to a large and necessary development of this line of work.

Among Protestant societies funds for the support of these orphan schools have been provided largely by special gifts for that purpose, and have not come directly from the treasuries of the missionary societies.

The Roman Catholic missionaries put greater emphasis upon orphan institutions than do the Protestants. Among the Protestants, in large part, orphan children are cared for in the boarding schools, and not in separate institutions. There are, however, separate orphanages, especially in India and Turkey, in which the latest reports show there are 20,206 children. In the orphanages under the Roman Catholic missionaries in the various countries of the world there are 89,699 children.

Japan. — When Protestant missionaries entered Japan about 1860, they found a considerable degree of education in the country, but not of the Western type. As missionaries could reside outside of treaty ports only when employed by Japanese, it became necessary for those who wished to take up their residence in the interior to be connected with some Japanese institution, in whose employment they were registered in the government records. At the same time, the desire of the Japanese for Western learning was increasing, and many Europeans and Americans were called to Japan to teach in the government schools. The mission schools were eagerly sought by the young men and young women of Japan as affording unusual opportunity to study English, constitutional government, history of Western nations, and, what may seem rather strange, the fundamentals of Christianity. In some of the earlier schools, as, for instance, those under the direction of the famous Guido Verbeck, the two subjects which were most eagerly sought by the Japanese pupils, all of whom came from families connected with the *samurai*, or titled classes, were constitutional government and Christianity. A large number of the men who became foremost in the reorganization of Japan and the development of constitutional government were pupils in those early mission schools.

Mission schools have a reputation for maintaining a standard of English and of music which it is impossible for the government schools to surpass. They also are said to have developed a strength of character in their students noticeably lacking in government schools. These mission schools exercise great care in the selection of teachers, basing school government upon Christian principles. The historic foundations of Christianity are taught to all the pupils, although in none of them are there religious tests for admission or graduation.

The grade of school in which missionaries chiefly work is the *Chu Gakko*, or middle school for young men, and the *Koto Jo Gakko*, or middle and high school for young women. In the empire there are twelve such mission schools for young men and forty-five for young women.

These are all beyond the experimental stage, no new schools having been opened in recent years.

The total number of young men who have received more or less instruction in the Protestant mission schools in Japan is about 25,000. From three to four thousand of these are graduates of the schools, either of the middle or higher course, or of both. Of those who have received or are receiving instruction, about 3 per cent are in the Christian ministry or some other form of special Christian work; 12 per cent are teachers in either mission or government schools; 5 per cent are officials under the government; 28 per cent are in some form of business; 1 per cent in military service, and 2 per cent in various other callings, while 7 per cent have died; 35 per cent are still in schools, and the rest are unreported.

There are certain professions in which almost no graduates of mission schools are found, namely, the military, medical, and legal. About 700 of the graduates of mission schools are engaged in farming, manufacturing, commerce, and in various arts and professions. Not a few are managers of banks and presidents of commercial companies. There are 117 graduates of mission schools who are active in official and political life, and among these a considerable proportion have risen to prominence. They hold positions in city and *ken* offices, postal and customs service; they are members of the Upper and Lower Houses of Parliament, mayors of large cities, and diplomats. It is, however, in the realm of ideas rather than in business or official life that the former pupils of mission schools have especially distinguished themselves. Here they have exerted their widest influence over social and national progress in Japan. It has been said that the sign " Importers of new ideas " might appropriately be hung over the entrance of every mission school in the empire. The graduates of these schools are prominent in teaching positions, even in the highest national schools.

It is stated on good authority that the students in mission schools originated magazine literature in Japan. They also hold prominent positions in journalism, many later graduates choosing that as a profession. The following is only a partial list of prominent Japanese journals which have graduates of mission schools either as editors-in-chief or as prominent members of the editorial staff: *The Mainichi Shimbun, The Kokumin Shimbun, The Hochi Shimbun, The Osaka Asahi Shimbun, The Nagoya Fuso Shimbun, Kagoshima Nichi Nichi Shimbun, The Chinzei Nippo, The Tokyo Asahi Shimbun, The Yorozu Choho, The Kahoku Shimpo, The Sendai Nichi Nichi Shimbun, The Jitsugyo no Nihon, The Eibun Shinshi, The Boken Sekai, The Bunko, The Waseda Daigaku Shippan Bu, The Chuo Koron, The Taiyo, The Jinsen Chosen Shimpo, The Moji Shimpo.* In the field of authorship, students from these schools present an equally interesting record. Eminent national poets, historians, lecturers, and authors on topics connected with education and sociology, as well as novelists, have come from these schools, and their writings have exerted and are exerting a strong influence on the thought of the empire. In fact, these have led the way in creating a new literature for Japan, a literature that is rapidly familiarizing the whole nation with the best ideals of the West. It naturally follows that the Christian press of Japan is under the direction and control of former pupils in these schools. All of the editors-in-chief of the Christian papers are of this class, and most of the assistant editors and contributors have received the same training. The leaders in the Y. M. C. A. movement in Japan are from the same class. The Doshisha, a Christian university established in Kyoto by Dr. Neesima, has a national reputation, and its graduates are sought for important positions because of the record they have made for moral strength, stability of character, and integrity of purpose.

In the education of girls in Japan, the mission schools have taken the lead, and have been of great influence in stimulating the government to make better provision for female education. It is impossible to follow the course of the graduates of mission schools for girls in the same way that we can follow the graduates from the schools for boys and young men. Most of these graduates are soon found in homes of their own. It is impossible to trace the influence of those homes, presided over by a Christian woman or one who has been trained in Christian schools, in shaping a new order of society in Japan. The number of mission schools for girls is reported as forty-five, with ninety-three mixed schools, including fifty-four kindergartens. There are twenty-two theological schools in the empire, conducted by missions, fourteen schools for training women for special forms of Christian work, and five kindergarten training schools for the education of kindergartners. The Roman Catholics have about eighty schools of all grades, attended by about 8000 pupils, but no data are given regarding the grade of these schools or the walks of life into which these students enter after graduation.

China. — As a nation China has been more favorable to higher education than any other great country of the world. For the last five hundred years, indeed, official positions have been more completely based upon a civil service examination than in any other country. This national education, however, contained nothing that is regarded in Europe and America as part of the curriculum of any educational system. While the national education gave a certain measure of mental discipline, it did not inform the student regarding the outside world, nor was anything in the line of science or mathematics included. The basis of the old educational system of China was the Confucian classics and Chinese history. (See CHINA, EDUCATION IN.)

Protestant missionary work began in China in 1807, and for a century endeavor has been made to exhibit to the Chinese the value of "Western learning," as this system of education was quickly named by the Chinese themselves. Acceptance was slow. Perhaps one of the most far-reaching results has been the turning of the minds of Chinese youth toward the Western world, which has resulted in sending to America and Europe a considerable number of young men for educational purposes. Not long since, the Chinese Students' Association, made up of several hundred Chinese youths studying in American universities and colleges, reported that over 80 per cent of their number came from mission schools in China.

Missionary education has received a great impulse since 1900, following the reorganization immediately after the Boxer Movement. The revival of Western learning in China is coincident with the inauguration of the new order and the development of the idea of constitutional government. Mission schools which were long tabooed by the masses of the people then became popular; the government system of education was changed by imperial order, and Western learning was made the basis of the official education of the Chinese empire. No longer does the old system prevail, and the new government is endeavoring to build up its own educational system on the model laid down by the missionaries and brought back to China by the Chinese students who have taken degrees in European and American universities.

It is impossible here to trace the history and development of the Protestant educational propaganda, and we can give only a summary of the work of seventy-three missionary societies in China. There are eighteen missionary universities and colleges in the country, with a total attendance of 919 students in the collegiate departments. These institutions are pretty well scattered throughout the empire, with locations generally at great political and influential centers, as, for instance, two in Pekin, two in Foochow, two in Canton, and others in Nanking, Hankow, Wuchang, etc. In theological, normal, and training schools there are 2544 students; in the boarding and high schools, 20,866; and in the elementary and village schools, 54,964; making a total in all the Protestant mission institutions in China of about 80,000 Chinese children and youth. To these should be added 122,000 pupils in Roman Catholic schools, the most of whom are in middle or primary grades, with one sixth of the entire number in orphanage schools; making a grand total of 202,000 Chinese youth in mission schools in the country.

Turkey. — There is probably no country in which mission schools have figured more prominently in the development of the intellectual and social life of the people than in the Turkish empire. The work of missionary education was begun in Turkey in 1820, and has been continuous to the present time. Until very recent years the missionary schools were the only ones based upon scientific methods of instruction. The pupils in these schools, which quite generally cover the empire north of Arabia, have come largely from the Syrian, Greek, and Armenian communities, although there have been in them all some pupils of other nationalities. Owing to the alertness of the Armenian and Greek minds and the readiness with which they have sought education, the mission schools in Turkey have developed into colleges more rapidly than in any other country, and, in the absence of government institutions to supply the need of higher education, these mission colleges have occupied a place in the empire which such institutions have assumed in few if any other countries.

To-day the mission colleges in Turkey, and institutions which have grown out of missionary work and are substantially a part of it, are affording the highest and most thorough scientific training available for young men and young women. As illustrations we mention Robert College (*q.v.*) on the Bosporus, which, although never under missionary control, has always had a missionary for its president, and has been conducted along precisely the same lines as missionary institutions; the Syrian Protestant College at Beirut, which began as a missionary school, but has since become independent under a separate board of trustees; and the American College for Girls at Constantinople, once missionary, but now independent.

Collegiate education for women has reached a high stage of development in Turkey. The Greek and Armenian races have been responsive to the call for the higher intellectual training of their women; and in response to this call three colleges have developed, the Central Turkey College for Women at Marash, the International Woman's College at Smyrna, and the college already referred to at Constantinople. Euphrates College at Harpoot in Eastern Turkey has two departments, one for women and one for men. The girls' high and boarding schools at Marsovan, Aintab, and Beirut have reached a stage of development which carries their pupils into the collegiate grade, although as yet these institutions do not bear the college name.

The influence of these colleges upon Turkey cannot be measured by the rolls of their pupils. A great number of national schools have sprung up among the Greeks, Armenians, and Syrians, as well as other nationalities, which employ teachers who were trained in mission schools. In this way modern missionary education has penetrated into the remote sections of the

Turkish empire and has prepared the people not only for constitutional government, but for the adoption of a general system of education which the new régime in Turkey is now endeavoring to establish. Many of the native teachers engaged in these collegiate institutions in Turkey have received special training in European and American institutions. A majority of the American colleges in Turkey are incorporated under the laws of Massachusetts or New York, and are partially endowed.

In these institutions to-day there are about 5000 young men and young women, natives of Turkey, taking a general course of instruction. This number includes the pupils in the preparatory departments, but does not include pupils of high school grade in institutions outside. The boarding and high schools, with the elementary and village schools in the empire, have over 40,000 scholars, making a total, with the normal and industrial institutions, of more than 48,000 pupils receiving their training in Protestant missionary schools. The Roman Catholics have extensive educational plants, in which some 68,000 pupils are receiving instruction under Christian training, making a total of nearly 120,000 children of Turkey receiving their education in mission schools.

One of the Moslem leaders in the inauguration of the new constitutional government in Turkey stated that they would never have dared to undertake such a bold step, had they not relied upon the influence of the missionary educational work which has been carried on in Turkey for two generations to sustain them and to make constitutional government possible.

India. — Beginning with Ziegenbalg, Plütschen, Schultze, and Schwartz in the eighteenth century, missionaries inaugurated an educational program which has since played an important part in the development of the intellectual life of modern India. In 1728 the Christian Knowledge Society began work in the Madras Presidency, and from that day to the present, Christian missionaries have been engaged in a multitude of forms of educational work. The first decided attempt at female education was undertaken in 1800. The government system of education was based upon Sanskrit, Arabic, and Persian, while the missionaries made use of the common vernacular and placed emphasis upon religious instruction. Dr. Alexander Duff, an early missionary, made a remarkable record as an educator. (See India, Education in.) Of forty-eight young men who were under his tuition, nine became ministers, ten catechists, seventeen professors and high-grade teachers, eight high-rank government officials, and four physicians and surgeons. He was especially influential in shaping the educational policy of the Indian government, which is now of almost universal application in India, Burma, and Ceylon.

In India and Ceylon the government method of carrying on its own educational work is largely through a subsidy to those mission schools that come up to the government standards and meet the requirements. In Ceylon, for instance, the support of the missionary primary and village schools comes almost wholly from the government grant, and in a large number of the schools in India by far the greater proportion of the funds for maintenance is supplied by the government. The schools thus aided are under the regular inspection of government officials, and the grant is based upon the number of pupils in the schools that reach a fixed standard. These grants are also given in still more liberal form to industrial institutions.

In the Protestant missionary school system in India there are thirty-seven collegiate institutions well scattered over the empire and directly connected with the Indian university system. In these colleges, nearly all of which are for young men, there are about 5000 matriculated students. In the 141 theological and normal schools there are 77,400 students. In the industrial training institutions and schools there are 9000 pupils, although there are many pupils in other institutions who are receiving regular industrial instruction. In the elementary and village schools of the country there are 362,000, with about 1000 in the missionary kindergartens. This makes a total in the Protestant missionary schools of all grades and classes in India, and representing eighty-five missionary societies, of about 458,000 children.

The island of Ceylon, although not densely populated, furnishes a good illustration of the influence of missionary educational endeavor. While in the entire island there is a population of only about 3,988,000, in the Protestant missionary schools on the island, consisting of three university and collegiate institutions, seven theological and normal training schools, forty-four boarding and high schools, six industrial institutions, and 871 schools of elementary village grade, there is a total attendance of 63,000.

The Roman Catholic figures for India and Ceylon report a school attendance of 225,000, making a total of pupils in these two countries in Protestant and Roman Catholic mission schools of 819,000 who are receiving their instruction in missionary institutions.

Africa. — Africa, unlike other countries that are named in this list, is not a united or compact empire; it represents no single government, and has no native administration at any point which is now developing education. Under the British flag the government is beginning to render some assistance to primary, intermediate, and normal education for native populations, but this affects only a limited area. Very little is done by the French and German governments, and perhaps less by the Portuguese in this direction. There is no country here named that is so dependent at the present time upon the educational work developed and carried on by missionaries as the continent of Africa. There is, moreover, little hope that in the near future any form of native government or of the foreign governments holding control in Africa will take advance steps in this direction. This being the case, the missionary educational work has the greater significance.

It should be stated also that in missionary education in Africa there is an increasing consciousness that the system that will be most valuable in the future must be more or less connected with some form of industrial training. While the African learns to read and write, he, by this method of training, is also learning new processes of agriculture, how to make brick and tiles for his home, how to construct his home according to improved modern methods, how to make his own agricultural implements and tools and furniture, and to do many other things which belong to a more civilized society. These processes of education are going on at the mission centers in different parts of the great African continent.

As might be expected, higher education in the line of collegiate work has been but little developed up to the present time among the natives of Africa. There are few institutions which should bear the name of college or university, and the number of students in these to-day aggregates less than two hundred. In theological and normal institutions that are training preachers and teachers for the lower schools, statistics show that there are over 2500 African youth receiving training. In the mission boarding and high schools the number of pupils passes the 20,000 mark. It is, however, in the elementary schools that the largest number of African youth are found. Protestant mission institutions of elementary grade in Africa, exclusive of the work carried on in Egypt, number over 405,000 pupils. Taking all of the Protestant mission institutions together, exclusive of Egypt, there are now under missionary instruction in Africa, in schools of all grades, a little more than 432,000 youth and children. This is probably largely in excess of the number of native youth in all of the other modern and equipped schools in the entire continent. The Roman Catholics have in schools under the direction of their missionaries in all Africa, also exclusive of Egypt, a school population of over 400,000. The figures which they furnish are not capable of as careful analysis and classification as the figures provided by the Protestant societies. This makes a total missionary school attendance of native African pupils of 832,000.

Statistics. — The following statistics will show the present strength as well as the growth of Protestant missionary educational work during the last decade, though these figures are changing rapidly: —

PROTESTANT

AMERICAN MISSIONARY SOCIETIES

	SCHOOLS	PUPILS
1900	6,252	240,263
1905	8,638	303,835
1909	9,949	437,138
1910	10,632	515,108

ENGLISH SOCIETIES

	SCHOOLS	PUPILS
1900	9,160	437,874
1905	11,447	628,407
1909	10,649	604,675
1910	11,179	662,723

GERMAN SOCIETIES

	SCHOOLS	PUPILS
1900	2,022	97,587
1905	2,466	120,817
1909	3,373	150,021
1910	3,130	159,547

CONTINENTAL AND OTHER SOCIETIES

	SCHOOLS	PUPILS
1910	5,274	224,661

The totals of schools and pupils, together with the summary of the schools of Christendom, are as follows, with their growth for the last decade: —

	SCHOOLS	PUPILS
1900	20,196	1,035,724
1905	27,835	1,246,127
1909	29,190	1,413,995
1910	30,215	1,562,039[1]

[1] About one fourth of these are girls.

Figures showing the growth of the Roman Catholic missionary educational work are not available, but the following statistics of the pupils recently reported show the number of students under Roman Catholic instruction under three classifications: —

ROMAN CATHOLIC

In Lower Schools, including Primary . . .	840,974
In Middle Schools (approaching the Boarding and High Grade in Protestant Statistics)	66,399
In Orphanages	89,699
Total	997,072

Their figures do not indicate the proportion of girls among the pupils under instruction.

Grand total of pupils in missionary schools in all mission countries: —

Protestant	1,552,039
Roman Catholic	997,072
Total	2,549,111

Cost of Missionary Schools. — It is difficult to state accurately the amount which mission boards and societies of Christendom at the present time are using annually for the support and development of educational work in their various mission fields. Including the support of those who are engaged in whole or in part in educational enterprises, together with the subsidies given to schools of various grades and character, it is probably not an exaggeration to say that at least $6,000,000 a year go directly or indirectly into the various Protestant missionary educational enterprises, in Africa and the Nearer and Farther East. A large part of the cost of this educational work is carried by the natives themselves. It can be said without exaggeration that the educational institutions that are called missionary around the world are carried on at an annual cost of not less than $12,000,000. It should also be stated that not a few institutions, all of which are here classified as missionary either in origin or in character and spirit, have organized themselves under separate boards of trustees, with charters from different states. This has been done in a large number of instances for the purpose of securing more funds for their support. Many of these stand to-day as distinctively missionary, and all are classified as Christian and are supplementing missionary work.

Coöperation. — During the last decade there has been a marked movement among the mission boards of various denominations to combine their efforts along higher educational lines in union collegiate and theological institutions, and all in the interests of economy and greater efficiency. This movement is progressing rapidly, and union Christian missionary institutions are constantly increasing in numbers, strength, power, and influence through the combined support and coöperation of two or more missionary organizations. Good illustrations of this are the North China Union Colleges at Pekin, in which three or more missionary societies unite (these include a college for young men, a college for young women, a theological seminary for young men, a men's medical college, and a women's medical college); the Union College at Nanking, in which three missionary societies unite; the Union Educational Movement in Chengtuhsien in China, in which more than half a dozen missionary societies join; the Union Theological College in Bangalore in southern India, participated in by several different communions.

Another marked step is now contemplated, which may not be classed as strictly missionary, but which probably indicates another step in the development of missionary education. The universities of Oxford and Cambridge in England and one or two universities in Scotland are uniting with several institutions in America, including Harvard University, McGill University in Montreal, and the University of Toronto, in developing a Christian university in Wuchang, China. It is expected that this university will be closely affiliated with the missionary colleges already established at that center, and that other missionary organizations will join in the plan.

Other institutions also are maturing along a somewhat similar line in other parts of China, as, for instance, the Yale Educational Mission in Chang Sha and the Harvard Medical Mission in Nanking. These indicate another step in the development of educational work of missionaries and institutions which are in sympathy and close coöperation with the original missionary enterprises.

The Place of Christian Colleges in the Educational Systems of Christendom. — It is a significant fact of history that the leading educational institutions of Christendom had their origin in schools which were started by the Church and for the primary purpose of strengthening and perpetuating the Church. Out of these church institutions have grown the great universities of England and America. The state universities followed long after, and received their inspiration and impulse from these church institutions. The educational awakening upon the continent of Europe in the seventh and at the beginning of the eighth century is traceable to the influence of the Irish-Scotch missionaries, who, wherever they located, founded centers of learning. Rashdall in *The Universities of Europe* declares that "so much of the culture of the old Roman world as survived into medieval Europe survived by virtue of its association with Christianity." "It was only among churchmen that an educational ideal maintained itself at all."

Dr. James S. Dennis says: "The pioneers of the educational revival of nations outside Christendom have been the missionary teachers who have always striven to have this mental awakening identified with Christian enlightenment. In this they have succeeded to an extent that is not surpassed in the educational provisions of the most favored communities of Christendom."

Reasoning not only from this analogy, but from modern movements which are distinctly traceable at the present time in many of the leading Asiatic countries, there is reason for assuming that mission schools started in the great East and in Africa by the Church are already becoming the nucleus and foundation for still greater and more advanced educational systems. Again the Church is proving itself the pioneer of the intellectual development of races and nations. J. L. B.

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MISSISSIPPI AGRICULTURAL AND MECHANICAL COLLEGE, AGRICULTURAL COLLEGE, MISS. — A state institution founded in 1878 as a land grant college for the benefit of agriculture and the mechanic arts. The college offers a two years' industrial training course, two years' training course for teachers, and a four years' course in agriculture, engineering, textiles, and education, leading to the B.S. degree. The entrance requirements are equivalent to a good knowledge of the common school branches. The enrollment in 1910–1911, including the summer school, was 1390. There is an instructing staff of sixty-five members.

MISSISSIPPI COLLEGE, CLINTON, MISS. — Founded in 1826 as Hempstead Academy, and now under the auspices of the Mississippi Baptist Convention. Preparatory and collegiate departments are maintained. No entrance requirements are stated. Degrees of A.B., B.S., and Ph.B. are conferred. The enrollment in 1911–1912 was 415. The teaching staff consists of twelve members.

MISSISSIPPI, STATE OF. — As first organized in 1799, the territory included the present states of Alabama and Mississippi. In 1817 the territory included within the present state was admitted to the Union, as the twentieth state. It is located in the East South Central Division, and has a land area of 46,362 square miles. In size it is about the same as New York. For administrative purposes the state is divided into seventy-nine counties, and these in turn into school districts, black and white, and special school districts. In 1910 Mississippi had a total population of 1,797,114, and a density of population of 38.8 per square mile.

Educational History. — There seem to have been no schools of any kind in the territory preceding 1795. A few private schools were opened by 1800, and in 1801 "the first public female school" in the territory was opened, though doubtless on a tuition basis. In 1802 the territorial legislature chartered Jefferson College, though it was not opened until 1811. Up to the time of its admission as a state the territory had done nothing beyond the establishment of a few tuition academies.

The only mention of education in the constitution of 1817 was a declaration, adapted from the N. W. Territory Ordinance, to the effect that "religion, morality, and knowledge being necessary to government, schools and the means of education should forever be encouraged in this state." The first legislature, meeting in 1818, passed an act giving the care of the sixteenth section lands to the judges of the county courts, to protect and lease, and with power to provide one or more schools in each county, as they might deem best. In 1821 a "Literary Fund" was constituted, additional sources of future income were specified, and a State Board of Directors was created for the management of the fund. A board of five to ten commissioners was provided for each county, to distribute the fund to a school or schools for the aid of such poor children in the county as might be selected, with the assent of their parents, to be taught reading, writing, and arithmetic. The income from the fund was to be used only for the building of schoolhouses and for the education of the children of the poor. The county school commissioners were to appoint, annually, a visiting committee to visit, examine, and report to the directors of the State Literary Fund, as to the condition of all schools. A form of teachers' certification, by the directors of the Literary Fund, was also provided for. Three years later this law, which had been a dead letter, was virtually repealed by a new law making the township the unit. Five trustees of schools and school lands were to be elected annually in each township, and they were to build schoolhouses on the school section, employ teachers, and lease the school lands. Practically nothing was accomplished under any of these early laws. The new constitution of 1832 merely reproduced the brief and inadequate section on education contained in that of 1817, and no attempt to organize schools was made for some years. In 1833 the Literary Fund, which had by this time reached $50,000, was distributed to the different counties for investment, and the state system of education provided for in the law of 1821 was abandoned.

About 1844, owing to immigration, increasing illiteracy, and the general agitation for education then going on in many states, the question of education in Mississippi began to attract new attention. In 1844 the University of Mississippi was created; in 1846, despite bitter local opposition, funds to establish it were voted; and in 1848 it began instruction. The central figure in the campaign for schools was Hon. A. G. Brown, Governor of the state from 1844 to 1848. In his inaugural in 1844 he pleaded with the legislature for a general system of common schools, open to all, and free to the poor. In 1846 a school law was finally enacted. This created boards of five school commissioners for each police district; established county school funds; and gave the commissioners power to open schools, license teachers, and levy specific taxes; but contained a proviso whereby no tax could be levied without the consent of a majority of the heads of families in each township, and made the law inoperative in any township if a majority filed a protest in writing against it each year. This almost completely nullified the law. The commissioners were to look after the sixteenth section lands and funds, and to report to the Secretary of State, who was made *ex officio* a general school commissioner for the state. The law proving ineffective, the ruinous policy of special laws for cities and groups of counties was begun in 1848, and this completely destroyed the chance for any general school system. Practically all of the succeeding legislation up to 1860 was of this character. The Civil War put an end to all of these efforts.

A new constitution was formed in 1868, which provided for a complete system of free public instruction for all children in the state. Rejected by the people in June, it was finally accepted by them in December. The section on education provided for a State Board of Education; for state and county superintendents; for a four months' school in each school district; for the establishment of a state school fund, by consolidation and additions; for a poll tax, for educational purposes; for general state taxation; for the establishment of an agricultural and mechanical college; and forbade sectarian control of any school funds. The detailed law of 1870 carried most of these provisions into effect, and established the first real state school system the state had known. County superintendents were to be appointed by the State Board of Education; each county and each city of 5000 population was created a school district; boards of subdistrict school directors were also created to look after and manage the school; county taxation of ten cents on the $100 for a schoolhouse fund and five cents for a teachers' fund was authorized; county examination and certification of teachers was provided for; and a form of the county system of school management was inaugurated. The law and the system of school taxation encountered much opposition, for many years, and the idea of popular education was combated openly and covertly. In time, however, the system was accepted, and slow but steady progress was made, although for a long time the schools were kept without a definite plan. What one legislature enacted the next modified or repealed.

In 1871 the Alcorn Agricultural and Mechanical College for negroes was opened. In 1873 the boards of district directors and the subdivision system were abolished, and their functions turned over to the county authorities. The patrons of each school were permitted, however, to elect trustees to care for the property, visit the school, and recommend teachers for election. A general state school tax of forty cents on $100 was levied, the proceeds to be distributed on census, though this was later changed to a fixed biennial appropriation. All schools were divided into two grades, corresponding to primary and grammar, and the monthly wages of teachers in each were fixed by law. In 1878 an agricultural and mechanical college for whites was established, and opened in 1880; and in 1885 a state industrial institution for whites was opened at Columbus. The system thus established weathered the political revolution of 1875–1876, and remained almost undisturbed up to 1886, when a complete revision of the school law was made. Uniform state examinations for teachers were instituted, and standards for teachers' certificates were insisted upon for the first time; county teachers' institutes were established; county superintendents were directed to fix the salaries of teachers in their counties according to a definite schedule, based on the certificate held and on evidence of teaching capacity; the payment of teachers was changed from a yearly credit to a monthly cash basis; and towns were permitted to form separate school districts, and to tax themselves for buildings and maintenance. This law has since remained the basis of the Mississippi school system.

Most of the educational provisions of the constitutions of 1868 were readopted in the new constitution of 1890, and a number of additions were made. The additions in the new constitution prohibited special or private laws for the benefit of any private or common schools; permitted the use of the Bible in the public schools; increased the amount of poll tax for schools; practically made the maintenance of a four months' school by state taxation and funds mandatory; established a literacy test for the exercise of the suffrage; made the maintenance of separate schools for the two races mandatory; and confirmed the establishment of an agricultural and mechanical college for each race, from the proceeds of the Congressional grants. Few changes were made in the school law following the adoption of the new constitution, the revision of 1886 still forming the basis for the state educational system. In 1893 the Peabody Fund established an Institute Conductors' Training School for the state, and grants for teachers' institutes were made by it to the state for a number of years. In 1896 the State Board of Examiners was created, with power to grant higher state teachers' certificates, to assist the Superintendent in the preparation of all examination questions used in the state, and to transfer teachers' licenses from one county to another. Epidemics of yellow fever and smallpox interfered greatly with the schools from 1896 to 1900, and almost no educational progress was made during this time. In 1904 a State Textbook Commission was created, and the first uniform state series of textbooks was adopted in 1905. In 1908 a law regulating child labor in factories was enacted, and in the same year a bill was passed providing for the establishment of an agricultural high school for whites in each county, with a county tax on all property up to two mills, for support, and with state aid of $1000 per school; but in 1909 this was declared unconstitutional. During the ten years from 1900 to 1910 there were two small increases in the annual state appropriation for schools, but there was little legislation of importance. By the legislatures of 1911–1912 much important educational legislation was enacted, the results of which are noted in the following section.

Present School System. — At the head of the present state school system in Mississippi is a State Superintendent of Public Education, a State Board of Education, a State Textbook Commission, a State Board of Examiners, and a State Board of Control for the higher educational institutions of the state. The State Superintendent is elected by the people for four-year terms, and has an annual salary of $2500. He is given general supervision of the public free schools of the state, and may prescribe rules and regulations for their organization and conduct; prepares all printed forms and blanks; renders official opinions, and construes the school laws; meets the county superintendents for conference; apportions the school funds semi-annually; requires annual reports from the county superintendents; and submits an annual report to the legislature, showing the condition of the schools. He is also *ex officio* a trustee of the State University, the State Agricultural and Mechanical College, the State Industrial Institute and College, the Alcorn Agricultural and Mechanical College, and the different state educational boards and commissions.

The State Board of Education consists of the Secretary of State, Attorney General, and State Superintendent. This board is a board of appeal from the decisions of the county superintendents, and has final jurisdiction; audits claims against the school fund; determines the allowance to the State Superintendent for contingent expenses; grants special certificates to teachers in Indian schools; may adopt a state course of study; names a list of institute conductors, and has oversight of the teachers' institutes in the state; and may make rules and regulations covering all matters of school administration not covered by law. The State Textbook Commission consists of the State Superintendent and eight educators, no two from the same congressional district, appointed by the Governor for five-year terms. This commission adopts uniform textbooks in the common school subjects for use in all of the schools of the state, and contracts with publishers for the same, districts being free to adopt supplemental books and books for higher branches taught. The State Board of Examiners consists of the State Superintendent and two teachers appointed by him, for four-year periods. This board prepares the examination questions used in all teachers' examinations in the state, and examines applicants for the county superintendency, and for state and professional teachers' certificates. The Board of Control consists of seven trustees appointed by the Governor, one of whom must be a farmer, one a lawyer, and one an architect, builder, or factory man. This board has full control of the four institutions of learning mentioned above.

For each county there is a county superintendent of public education, elected by the people for four-year terms. To be eligible for election to the office he must pass an examination on all the subjects required for a first-grade county certificate and on the art of teaching. The county superintendent acts under the instructions of the State Superintendent and the State Board of Education, and by law is required to employ all teachers for the schools, and to fix their salaries; to examine the reports of teachers and trustees; to enforce the course of study adopted by the State Board of Education, and the textbooks adopted by the State Textbook Commission; to enforce the rules and regulations in reference to the examination and certification of teachers; to visit and inspect the schools; to decide controversies (appeal to the State Board allowed in most cases); to keep a record of the proceedings of the county board of education, and of his official acts; to make annual reports to the board of supervisors, the mayor and aldermen of special city districts, and to the State Superintendent; and to instruct trustees as to their duties. For each county there is also a county board of education, a county board of examiners, and a county library commission. The county board of education is composed of the county superintendent, together with one member from each supervisorial district in the county, to be appointed by the county superintendent, with the consent of the board of county supervisors. The Superintendent may remove members for cause, and may fill vacancies. The board meets annually, and has few functions. Its chief duties are to define and alter the boundaries of the white and black school districts, and to locate schoolhouses; to approve the creation of special districts in unincorporated villages; to provide educational facilities for small numbers of isolated children; and it may locate the public school, in any school district, in connection with a chartered institution of learning and provide for joint control. If there is a sufficient number of Indian children in the county, the board may establish an Indian school for them. The county board of examiners consists of the county superintendent and two teachers holding first-grade teachers' certificates, appointed by him each year, prior to the September examinations. This board conducts the examinations of all teachers applying for teachers' certificates. The county library commission consists of the county superintendent, together with two teachers holding first-grade teachers' certificates, named by him. Their function is to select and publish lists of library books from which district libraries may purchase; to make rules and regulations for the control of school libraries; and to receive annual reports from each library in the county.

Each county is divided into ordinary school districts and " separate " or independent school districts. School districts may be formed by the county board of education, whenever there are forty-five children of school age of either race, but where the distance is too great, or where streams or lack of roads make attendance difficult, districts may be constituted for fifteen children. In the case of isolated families, ten children may be declared to form a "special" school district. "Line" (joint) school districts may be formed by the action of two county boards. Consolidated school districts have recently been provided for, with transportation for pupils living more than two miles from the school. Schools with a monthly attendance of less than five may be closed at the end of any month. For each common school district the patrons elect a board of three school trustees, one each year, and for three-year terms. The election is held in annual meeting, the first Saturday in August, and the annual school meeting seems to have almost no other function. If the patrons fail to elect, the county superintendent appoints. The board elects one of its members as secretary, and may designate its choice for teacher to the county superintendent. If the trustees express no choice, or if the person chosen fails to secure a teacher's certificate, the county superintendent appoints. The final appointment, fixing of salary, and contract rests with the county superintendent. The trustees are to visit the school, provide fuel, care for the property, settle disputes (with appeal to the county superintendent), and may suspend or expel pupils. They can spend no money unless authorized to do so by the county superintendent.

Any municipality, by ordinance of its mayor and board of aldermen, may erect itself into a special school district. Similarly, any unincorporated district having sixteen square miles of territory, on petition of a majority of its electors, may be set off as a special district by the county board of education. All such special districts are financially independent of the county. For all such special districts a board of five trustees, for three-year terms, is appointed by the mayor and aldermen in cities, and by the county superintendent in unincorporated places. The powers and duties of boards in special districts are practically the same as in common school districts, and, in addition, they may employ principals and a superintendent; may elect their own teachers, contract with them, and fix their salaries; may maintain both graded schools and a high school, and may charge tuition for the latter; and may estimate needed funds, up to three mills, and submit the estimate to the aldermen or county supervisors for levy.

School Support. — Mississippi originally received 902,744 acres of land in the sixteenth-section grants, as well as two townships for a seminary of learning. Some of the sixteenth-section land is still unsold. The total common school fund of the state is now about $3,500,000. The constitution of 1890 practically requires an annual state appropriation sufficient, with poll taxes and the interest on the permanent fund, to maintain all of the schools for four months each year. This state appropriation which at present is $ 1,424,088 a year, constitutes the chief source of revenue for the school system. County taxation up to three mills is permissible, and is resorted to in a number of the counties, but the chief local taxation is in the special and financially independent (town and city) districts, where a seven months' school at least is always maintained. Tuition fees for high school instruction are still permitted. To the county agricultural high schools is granted $30,000 a year of state aid, and $5000 a year to weak districts.

Educational Conditions. — The property valuation of the state compared with the population is very low, and this shows itself in the matter of school support. In percentage of children, five to eighteen years of age, in the total population (34 per cent); in the amount which each adult male must contribute ($1.51) to produce $1 of school money for each child; and in the small amount of school money raised for each child five to eighteen years of age; Mississippi is only surpassed by one state, — South Carolina. But little is spent on school buildings (34 cents per capita of attendance, at last report, as against an average for the United States, of $6.45), and the average value of all school buildings in the state is only about $300. The state has no cities of over 25,000, and 88.5 per cent of its people live in country districts. Of the total population in 1910, 56.2 per cent were black and 43.7 per cent white. In some counties the blacks outnumber the whites three, four, and five to one. 99.5 per cent of the population is native born. The average length of term of all schools is about seven months, while in country districts it is less than six. In 1908 a child labor law was enacted. The state has no compulsory education law as yet. The state has a school library law whereby any district which subscribes $10 and provides a bookcase may receive a similar amount from the county school fund, though not more than ten districts can be aided each year, and no district can receive aid a second time, if other districts are applying.

Teachers and Training. — The state employed about 10,166 teachers in 1910, and at an average of about $250 a year. County superintendents in employing teachers are limited by a state wage scale, varying from $15 to $75 a month for teachers, and up to $100 for principals. Three grades of county teachers' certificates are issued, and only those holding a first-grade certificate can receive more than $30 a month. The examination subjects are the common school subjects, the grade of certificate varying with the percentages made in the examination. The state also issues two grades of certificates: (1) State licenses, which are the same as a first-grade county certificate, but, on examination, have been validated for the entire state; and (2) Life diplomas, which involve high school subjects, and are the only certificates issued which represent any educational standards. County teachers' institutes and summer normal schools have for years rendered a valuable service in educating the teachers of the state. The state has for some time made provision for the training of colored teachers at Holly Springs, and a normal school for the training of white teachers, located at Hattiesburg, was opened in 1912.

Secondary Education. — The public high schools are mostly of low grade, and most of them are still in part grammar schools, though in the nine cities of more than 8000 inhabitants, well-organized high schools are found. The recent legislation relating to agricultural high schools promises much for future development. In all, 137 high schools were reported in 1911, with 394 teachers and 7763 pupils enrolled. Seven public and twelve denominational schools offer secondary instruction to the colored race.

Higher and Special Education. — The University of Mississippi, founded in 1844 and opened in 1848, and located at University, stands at the head of the public school system of the state, though it is only within the past ten years that any real coördination between it and the public school system has been effected. The school of pedagogy of the university, established in 1893, has done a valuable service, serving as a form of state normal school for white teachers for the state. The university summer school for teachers has been well attended. The Mississippi Agricultural and Mechanical College for white students, founded in 1878 and opened in 1880, at Agricultural College, and the Alcorn Agricultural and Mechanical College for colored students, opened in 1871 at Alcorn, are also state institutions. In addition, these state institutions are assisted by the following: —

Institution	Location	Opened	Control	For
For Whites				
Port Gibson Female College	Port Gibson	1839	M.E. South	Women
Whitworth College	Brookhaven	1859	M.E. South	Women
Central Miss. Institute	French Camps	1886	Presb.	Women
Millsaps College	Jackson	1892	M.E. So.	Both Sexes
Belhaven College	Jackson	1894	Nonsect.	Women
Stanton College	Natchez	1894	Nonsect.	Women
Meridian Male College	Meridian	1901	Nonsect.	Men
Meridian Women's College	Meridian	1903	Nonsect.	Women
For Negroes				
So. Christian Institute	Edwards		Discip. of Chr.	Both Sexes
Rust University	Holly Springs		M.E.	Both Sexes
Kosciusko Industrial College	Kosciusko			Both Sexes
Tougaloo University	Tougaloo		Congr.	Both Sexes
Mary Holmes Seminary	Westpoint		Presb.	Both Sexes

Many of these institutions are in large part preparatory schools; all have small endowments, and the collegiate work is of a somewhat elementary type.

The State Institution for the Blind, at Jackson; the Institute for the Deaf and Dumb, at Jackson; and the State Industrial Institute and College for whites, at Columbus, are supported by the state. The last named offers business, normal, collegiate, industrial, and music courses to both sexes. E. P. C.

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MISSISSIPPI, UNIVERSITY OF, UNIVERSITY, MISS. — A state-maintained coeducational institution chartered in 1844 and opened in 1848, out of the endowment of one township granted by Congress in 1819. The institution has been liberally supported by appropriations from the legislature. The following departments are maintained: academic, education, engineering, law, medicine, pharmacy, science, literature, and arts. The entrance requirements are fourteen units. The university confers the degrees of A.B. and A.M. in science, literature, and arts; B.E. and C.E. in engineering; A.B. and B.S. in education; Ph.G. and Ph.B. in pharmacy; and LL.B in law. The courses in the last two departments are two years in length. The enrollment in 1911–1912 was 480, and the faculty consists of forty-three members.

MISSOURI, STATE OF. — First organized as a separate territory in 1812, and admitted to the Union as the twenty-fourth state in 1821. It is located in the West North Central Division and in about the center of the Mississippi Valley, and has a land area of 68,727 square miles. In size it is about as large as all of New England and New Jersey combined, and about one third the size of France. For administrative purposes the state is divided into 114 counties and the city of St. Louis, and the counties are in turn divided into cities, towns, villages, and rural school districts. In 1910 Missouri had a population of 3,293,335 and a density of population of 47.9 per square mile.

Educational History. — The first school in Missouri is said to have been opened by J. B. Trabeau in 1774, and he is reported to have been teaching forty years later. The first attempt to organize a public school was made at St. Louis in 1817, when the village, acting under a territorial law, appointed a board of trustees to organize a public school. The attempt was not successful, and it was not until 1838 that schools were opened there. (See St. Louis, City of.) The first constitution was framed in 1820. This contained two sections relating to education. The general assembly was instructed to preserve the school lands; apply the income as it should be; to establish at least one school in each township, "where the poor may be taught gratis," and "as soon as may be," to establish a university, as provided for in the grant of two townships for a seminary of learning. Commissioners for the care of the school lands were to be appointed by the county courts, five for each county by the law of 1820, and two for each township by the law of 1822, and they were authorized to build schoolhouses, as needed, when the funds would permit. In 1824 the first real school law was enacted. This made each township a school district; school boards of five were created to build or to rent schoolhouses, employ a teacher, appoint school visitors, and to make rules and regulations; and, on demand of two thirds of the voters, the boards were to levy a tax for the desired term. Little was done under this law. In 1835 the law relating to schools was revised. Three trustees were to be elected for each township; some of the powers of supervision were taken from the school visitors and given to the trustees; and biennial reports were to be made to the county courts. A "Committee for Literary Purposes," virtually a State Board of Education, was also created, to consist of the Governor, Auditor, Treasurer, and Attorney-General. In 1839 a new revision of the school law was made, the office of State Superintendent of Common Schools was created, county commissioners and township inspectors were provided for, and a three months' school term was required. The office of State Superintendent was abandoned two years later, however, and the Secretary of State again received such reports as were made, acting *ex officio.* The census of 1840 showed that most schools were still private, there being but 642 primary schools in the state, St. Louis included, and but 526 pupils educated wholly on the public charge. In 1842 only 28 of the 77 counties then organized had schools. By 1850 there were 1570 public schools, though nearly one half of the income still came from tuition fees. In 1844 the state university, provided for in the constitution of 1820, was opened; but it had a very struggling existence until after 1853.

In 1853 the office of State Superintendent of Schools was reëstablished, and the first public high school in Missouri was opened in St. Louis. In 1855 a revised school law was enacted. This law created the office of county school commissioner, and made a number of improvements in the system. By 1858 every county had been organized into the public school system. By 1861 there were 5670 teachers employed, and the expenses of the schools were about $850,000, one fourth of which came from rate bills. The coming of the war put an end to this school system, and the legislature of 1861 abolished the office of State Superintendent, and suspended the school appropriation. During the war the schools of the state were virtually closed, and the office of State Superintendent of Schools was not reëstablished until 1865. The public school system of Missouri really dates from after the Civil War.

A new constitution was adopted in 1865, which made a much more detailed provision for the creation of a state school system. Separate schools for the colored race were permitted, but the apportionment of school money was to be made without regard to race or color. The State Board of Education was continued, and a Superintendent of Public Schools was provided for. The maintenance of the state university was made mandatory. A three-months' term was required, and permission was given to enact a compulsory education law. The school funds were safeguarded; the investment of the principal narrowly limited; and a state tax, and apportionments to equalize inequalities, were permitted. The new school law of 1866 carried these provisions into effect. Separate schools were permitted, if twenty or more colored children were in any district. The township, while still nominally remaining the school district, was in reality abandoned for the Iowa plan of subdistricts, with three directors for each, thus virtually introducing the district system. County superintendents, elected for two-year terms, were provided, and given the full functions of a county superintendent. Cities were permitted to organize under boards of education of six, with the usual powers. This school system lasted ten years, when it was superseded by a third constitution and a new school law. In 1870 two state normal schools were established for white teachers (Warrensburg, opened in 1871; and Kirksville, established privately in 1867, and adopted by the state in 1872), and one for colored teachers (Lincoln Institute, at Jefferson City). In 1874 a third school for white teachers was authorized at Cape Girardeau. In 1874 the first textbook law was enacted, providing for county uniformity, the presidents of the district school boards of the county constituting a textbook commission.

In 1875 the constitution adopted at the close of the war was abandoned, and a new one, under which the state has since been governed, was substituted. Most of the provisions of the constitution of 1865 were retained, though the statements in the new constitution were in some cases less forceful and less emphatic. This constitution of 1875 and the laws following form the basis of the present Missouri school system.

Since 1875 four periods in Missouri education stand out. From 1875 to 1883, under the administration of Superintendent Shannon, was a period of material organization, and the maintenance of a system of public education was changed from a questionable undertaking to a settled public policy. From 1883 to 1891, under Superintendent Coleman, and following the period of organization, came a period of agitation for careful work in the fundamentals of elementary education, and for perfection in classroom management. The only legislation of any importance during this period was the repeal of the county textbook law in 1885, leaving the state under district adoption until 1891; the amendment to the constitution in 1887, changing the percentage of state revenue which must be appropriated to education from one fourth to one third; the lengthening of the school term from four to six months in 1889, if a tax levy of forty cents on the $100 would permit of it; and the enactment of a permissive county superintendency law in 1889, permitting any county so desiring to vote to employ a county superintendent. But nine counties had provided county superintendents as late as 1903.

From 1891 to 1899, under Superintendents Wolfe and Kirk, was a period of agitation for a better school system and a broader outlook in education, and a period of struggle against the extreme conservatism of the state in educational matters. The legislation during this period was rather meager, and centered around textbooks and the training and certification of teachers. In 1891, after six years of district adoption of textbooks, state uniformity in textbooks was substituted. An Institute Board of Examiners now superseded the county commissioners, in the matter of certificating teachers; three grades of teachers' certificates were issued; and teachers were certified after two weeks' attendance at the summer county institute. Two years later the training school for institute conductors was abolished, and a new law rigidly fixed the weekly wages to be paid institute conductors and instructors. The same year the State Reading Circle, which had existed from 1884 to 1887, was revived and made effective. In 1899 the teachers' certification law was again revised; a graded series of certificates provided for, which materially raised the standard; uniform questions for the state were to be supplied; and the certification of teachers after a two weeks' summer institute was abandoned. The development of high schools was stimulated during this period, and the state university, for the first time, began to receive some real recognition.

Beginning with 1900, under the administration of Superintendents Carrington and Gass, the state has experienced an educational awakening before unknown. This last period has been essentially one of reconstruction and unification, and marked educational progress has been made. In 1901 a state library law was enacted, and a State Library Commission, consisting of the State Superintendent and four appointed by the State Board of Education, was created. County boards of education, consisting of the county school commissioner, one appointed by the county court, and one appointed by the State Board of Education, were also created, and given some powers of supervision. They were authorized to supervise and grade the rural schools, to issue a county course of study, to renew teachers' certificates, and to approve summer schools. The consolidation of school districts was first authorized in 1901, also. In 1902 the people approved a constitutional amendment to extend and renew the state's Certificates of Indebtedness to the School Fund, and the discussion preceding the election brought out clearly the necessity for more revenue for schools. In 1903 the summer county institute law was repealed, a three days' county teachers' association in the autumn was substituted, and attendance for ten to twelve weeks in an approved summer normal school was substituted for the two weeks at the summer county institute. The State Superintendent was authorized also to inspect and classify the high schools of the state. In 1904 a constitutional amendment, providing a five cents additional tax, to be distributed to the school districts and to be used in supplying free textbooks and supplies, was defeated. In 1905 the state textbook law, enacted in 1891, and under discussion ever since, was entirely repealed, and county adoptions once more substituted; two new normal schools were established, at Springfield and Marysville, both of which were opened the next year; and the first compulsory education law was enacted. In 1907 the school law was revised and a number of changes made. The State Library Board was changed to its present form; state inspectors of high schools and of county schools were provided; the school term was increased from six to eight months, if a forty cent tax will provide the necessary funds; districts having less than twenty-five children were authorized to close their schools and transport their children; orphans, half orphans, and dependent children were to be educated free in any district; boards were permitted to employ superintendents for two years instead of for one; and St. Louis was permitted to require pupils to attend the whole time the schools were in session. In 1909 the compulsory education law was amended to require attendance, outside of St. Louis, for three fourths of the time the schools are in session, and boards in towns of 1000 or over were authorized to appoint attendance officers. Also in 1909, after thirty years of agitation, a county supervision law was enacted and made mandatory for all counties, with state aid of $400 toward the salary of each county superintendent; all state aid to districts not providing $350 was cut off, unless they raised a tax of forty cents; special state aid to poor and weak school districts was granted, under certain restrictions; night schools, and an eleven-month term in cities, for physical training, were both permitted; and a state industrial home for negro girls was established. In addition, the school laws applicable to all schools (Section I) and to common schools (Section II) were thoroughly revised. In 1911 the child labor law was extended to all cities of 5000 inhabitants or over; the certification bill was revised so as to give the State Superintendent the supervision of all certification; and the method of apportioning school funds was revised so as to substitute a combined teacher and attendance basis for the old census basis.

Present School System. — At the head of the school system is a State Board of Education and a State Superintendent of Public Instruction. The State Board is an *ex officio* body, and consists of the State Superintendent as President, the Governor, Secretary of State, and the Attorney-General. This board has nominal supervision of the educational interests of the state, but its real work is the investment of the school funds and the sale and preservation of the school lands. The Superintendent of Public Instruction is elected by the people for four-year terms. He is also charged with the supervision of the schools and the school funds of the state; confers and advises with county school officers; may visit and inspect schools; prepares all questions for the examination of teachers; has general supervision of all examinations, and the grading of the answers; issues state certificates, valid anywhere in the state; receives annual reports from all school officers and state institutions; and makes an annual report to the Governor. There is an Inspector of High Schools, who assists in classifying and prescribing courses for the high schools, and an Inspector of Common Schools, who assists in their examination and approval.

Below the State Superintendent is a county superintendent for each county, the county boards of education having been abolished by the county superintendency law of 1909. The county superintendents are elected by the people in district school meetings for four-year terms; must have taught two years in the preceding four, or have spent the preceding two years in a college or normal school; and, in addition, must hold a college or normal diploma, a life state certificate, or a first-grade county certificate. The county superintendent has general supervision of the schools of the county, except in the case of cities, towns, or villages employing a superintendent, with at least half his time free for supervision. The Superintendent must visit each school yearly; supervise the work and the accounts of the district officers; issue a course of study; adopt a plan of grading for the schools; arrange for examinations and for graduation from the district schools; hold six public meetings each year, at different points in the country, to instruct and to advise; hold a county teachers' institute in the autumn; and must follow the instructions of the State Superintendent and make an annual report to him. An especially meritorious provision of the law is one requiring each county superintendent to spend five days each year at a convention of school superintendents, and twenty days each year in the state university, a state normal school, or in a manner approved by the State Superintendent, and in the study of rural school problems and school supervision. The salary for the office ranges from $700 to $1500, and of this the state pays $400, in each case. County uniformity in textbooks is secured by the county textbook commissions, consisting of the county superintendent and two teachers, one appointed by the county court and one by the State Board of Education. Cities of 100,000 or over and accredited high schools may select their own books. This commission adopts books for five-year periods, from a printed list of registered books supplied by the State Superintendent. Publishers have to be properly licensed to sell, and books and prices must be on file. Supplemental books are not included. Indigent pupils may be supplied with books free.

Below the county are four classes of school districts: (1) common, with three school directors, elected in annual school meetings; (2) consolidated school districts, with boards of six directors; (3) town school districts in towns, villages, and cities of the fourth class, with boards of six school directors; and (4) cities of the first, second, and third class, under boards of education and special laws. The township unit is permissible, but is little used.

Each common school district holds an annual meeting, at which vacancies are filled, and one school director is elected, for a three-year term. The board of trustees then organizes by electing one of their number as clerk, who then performs most of the functions assigned to the board. The school meeting may also vote to lengthen the term beyond eight months; may vote a tax in excess of forty cents, or a tax for buildings or equipment; may decide changes in boundaries, or site; may direct the sale of property, and vote on allowing the schoolhouses to be used for specified purposes; and once in four years designates its choice for county superintendent. City, town, and consolidated districts may select a secretary and a treasurer, not members of the board; may establish graded schools, high schools, and libraries, as needed; and must maintain a term of at least eight months. Consolidated districts may be formed of three or more contiguous common school districts, or a village and two adjacent districts, and may maintain elementary and high schools. Any district which provides less than eight months school, if a tax of forty cents will provide it, forfeits its organization. School boards in all classes of districts may borrow, by vote of the district, up to 5 per cent of their assessed valuation; may make rules and regulations for the government of their schools; admit and suspend pupils; require a medical examination of any pupil; contract with teachers; have an annual school census taken; condemn sites; estimate funds needed; maintain separate schools for the two races, establish a negro school whenever there are fifteen negro children in the district, and provide equal privileges and terms for each race; and make an annual report to the county superintendent and to the county clerk. The latter reports all statistics to the State Superintendent.

School Support. — Missouri, on its admission as a state, received two townships of land for a university; the sixteenth section in every township for common schools; and seventy-two sections of saline lands for schools, — the sixteenth-section lands being given to the state for the benefit of the townships. The sixteenth-section grants amounted to 1,199,139 acres. In 1837 the saline land fund, together with the Surplus Revenue fund ($382,335) then received, was constituted a permanent state school fund. To this was added the money received from the sale of the State Tobacco Warehouse ($132,000) in 1865. This fund now amounts to $3,159,281, and yields an income of about seventeen and a half cents per pupil per year. The one third of the state revenue added raises the amount to about $1.80, the amount having risen rapidly with the recent increase in wealth in the state. The swamp-land grants of 1849 Missouri put into a series of county school funds, to which have been added the proceeds of fines, forfeitures, and the sale of estrays. These funds now amount to $5,750,000. The sixteenth-section township funds amount to a total of approximately $4,000,000. Both the county and the township funds vary greatly in amount, being from ten to thirty times as large in some counties as in others, and produce very unequal incomes per pupil in the different counties and townships. The income from all school funds must be used only for teachers' wages.

The largest proportion of the money for support comes from local taxation, which may go to sixty cents on the $100 in cities and to forty cents elsewhere, and may exceed these limits by a vote of the people. A tax of forty cents must be levied, if necessary to provide an eight months' school. If a tax of forty cents will not provide sufficient funds, with a salary of $40 a month to the teacher, to provide an eight months' school, the State Treasurer will add an amount sufficient, provided the district is not less than nine square miles in area, has an assessed valuation of $40,000 or more, a school census of twenty-five, and has levied a tax of forty cents for the teachers' fund and twenty-five cents for incidental expenses. Such aid cost the state $13,078 in 1910. All other school money was distributed on census up to 1911, but thereafter all state money is to be apportioned on the combined basis of teachers employed and aggregate days' attendance. The total cost of the school system in 1910 was about $13,000,000, or about $3.97 per capita of the total population.

Educational Conditions. — Aside from two large cities and a few smaller ones, which contain 30.8 per cent of the total population (St. Louis and Kansas City contain 28.1 per cent), 57.5 per cent of the people live in rural districts. Of the total population, 95.2 per cent are white and 4.8 per cent negro, while 93 per cent are native born, and about 5 per cent are illiterate. Of the foreign born a little over one half are Germans. The state has many small schools, and very unequal educational conditions in the different parts of the state. Not much headway has as yet been made in the matter of the consolidation of school districts, or in the provision of school libraries. The compulsory education law requires the attendance of children, eight to fourteen, for only three fourths of the time the public schools are in session, and the same for employed children, fourteen to sixteen, unless excused for a number of statutory reasons. Cities and towns of 1000 population may appoint attendance officers, who may enforce attendance and visit factories. Cities of 10,000 or over may establish parental schools. Children, eight to fourteen, cannot be employed in any mine, factory, or shop during school hours, unless possessed of a certificate showing attendance at school for three fourths of the school term. City school authorities may contract with homes established for the care of delinquent, dependent, or neglected children, for their care and training. Children who are orphans or half orphans, or dependent, may receive free schooling in any district where they find either a temporary or a permanent home.

Teachers and Training. — The state employed approximately 19,000 teachers in 1911, about one fourth of whom were men. For the training of new teachers, the state maintains five normal schools for whites and one for the colored race. The city of St. Louis also maintains an institution for the training of teachers for the city. All of the state normal schools (five for whites and one for colored students) and the state university maintain summer sessions. Three grades of certificates are issued, these being arranged in a graded series. The questions are furnished by the State Superintendent, and are uniform throughout the state. The county superintendents act as agents in giving the examinations, and certify the professional grade of the candidate, but the State Superintendent has oversight of the grading of the papers and the granting of the certificates to teach. Certificates may be renewed. County institutes are to be held in each county, and ten or more are to be provided in the state for colored teachers. Cities of 300,000 (St. Louis) examine their own teachers and conduct their own institutes. Grades made in approved summer schools may be accepted in lieu of examinations in the subjects covered.

INSTITUTION	LOCATION	OPENED	CONTROL	FOR
St. Louis University	St. Louis	1829	R.C.	Men
Linwood College	St. Charles	1831	Presby.	Women
William Jewell College	Liberty	1849	Bapt.	Men
Christian Brothers College	St. Louis	1851	R.C.	Men
Christian College	Columbia	1851	Christian	Women
Christian University	Canton	1853	Christian	Both sexes
Westminster College	Fulton	1853	Presby.	Men
Carleton College	Farmington	1854	M.E.	Both sexes
Lexington College	Lexington	1855	Bapt.	Women
Stephens College	Columbia	1856	Bapt.	Women
Central College	Fayette	1857	M.E. South	Both sexes
Washington University	St. Louis	1859	Nonsect.	Both sexes
Central Wesleyan College	Warrenton	1864	M.E.	Both sexes
Pritchett College	Glasgow	1866	Nonsect.	Both sexes
Central College for Women	Lexington	1869	M.E. South	Women
Morrisville College	Morrisville	1872	M.E. South	Both sexes
Drury College	Springfield	1873	Nonsect.	Both sexes
Synodical Female College	Fulton	1873	Presby.	Women
Hardens' College	Mexico	1873	Bapt.	Women
Park College	Parkville	1875	Presby.	Both sexes
Pike College	Bowling Green	1881	Nonsect.	Both sexes
Conception College	Conception	1883	R.C.	Men
Tarkio College	Tarkio	1883	U. Presby.	Both sexes
Cotley College	Nevada	1884	Nonsect.	Women
Missouri Wesleyan College	Cameron	1887	M.E.	Both sexes
Missouri Valley College	Marshall	1889	Cumb. Presby.	Both sexes
George R. Smith College	Sedalia	1894	M.E.	Negroes

Secondary and Higher Education. — The development of secondary schools in the state has been rapid during the past decade. Many small and short-term schools have been developed, and put on the accredited list. Four hundred nineteen high schools were reported in 1910, about one half of which were classified as first grade. Any city, town, or consolidated district may establish a high school, and any four or more common school districts may unite to form a joint high school, if approved by the people. In the latter case, 20 per cent of the teachers' fund may be used for high school purposes. Teachers in high schools must hold a first grade county or a state professional certificate.

Higher Education. — The University of Missouri, at Columbia (*q.v.*), stands as the culmination of the system of public education of the state. The agricultural college is combined with the university at Columbia, but the school of mines is located at Rolla. The university is assisted in the work of higher education in the state by the institutions as shown on page 275.

Many of the above are small and struggling institutions, and nearly all of them were founded before the state university began to receive real support from the state.

Special Education. — The state also maintains the Missouri Training School for Boys and Girls, at Booneville; the State Industrial Home for Girls, at Chillicothe (both reformatory); the Missouri School for the Blind, at St. Louis; the Missouri School for the Deaf, at Fulton; and the Missouri Colony for Feeble-Minded and Epileptics, at Marshall. E. P. C.

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MISSOURI, UNIVERSITY OF, COLUMBIA AND ROLLA, MO. — A coeducational institution, forming part of the public school system of the state of Missouri, founded in 1839. The present organization, with two colleges (Arts and Science, and Agriculture) and schools for professional and graduate work, was adopted in 1909. The separate divisions, each of which was in some form differentiated from the rest of the institution in the year indicated, are: College of Arts and Science (1839); School of Education (1867); College of Agriculture (1870); School of Mines and Metallurgy at Rolla (1870); School of Law (1872); School of Medicine (1873); School of Engineering (1877); Graduate School (1896); School of Journalism (1906). Special minor divisions are the Extension Division, the Summer Session, the Agricultural Experiment Station, the Engineering Experiment Station, the Mining Experiment Station, and the Military Department. All of these divisions are located at Columbia, with the exception of the School of Mines and Metallurgy and the Mining Experiment Station, which are situated at Rolla.

The entrance requirements are fifteen units for the College of Arts and Science, the School of Mines, and the College of Agriculture; and in addition two years of college work for all the other schools. These requirements, which are on the certificate basis, have been strictly administered, and this policy has stimulated and built up an excellent system of secondary schools in the state. The institution was one of the first four state universities admitted to the benefits of the Carnegie Foundation.

The final control over the institution is vested in the Board of Curators, which is appointed by the Governor of the state and is granted large powers by the state constitution. The internal organization is based on a general university faculty of all teachers of the rank of assistant professor and above, and special faculties for the various divisions. The university faculty assumes an unusually large degree of responsibility, and to it report many of the committees that in similar institutions report to the board of control.

The university holds the distinction of establishing the first school of education in a state institution, and of establishing the first school of journalism in the world.

The institution has a productive endowment fund of $1,258,839, and receives the income of a 5 per cent state tax on collateral inheritances. Almost one third of its income is derived from the general revenues of the state by legislative appropriations. A movement to give the university other permanent support as a substitute for legislative appropriations has been under way for several years, but so far has not been successful. The receipts from fees are insignificant. The total income for 1911 was $875,000. The enrollment of students for 1911–1912 was 3063. Albert Ross Hill, LL.D., is the president. C. A.

MISSOURI VALLEY COLLEGE, MARSHALL, MO. — A coeducational institution chartered in 1881 and opened in 1889 under the charge of the Presbyterian Church of Missouri. An academy, a college, and a school of music are maintained. The entrance requirements are sixteen units. Studies are divided into required subjects and classical, modern language, and science courses leading to the A.B. and B.S. The enrollment in 1911–1912 was 105 students in the college proper. There are fourteen members on the faculty.

MISSOURI WESLEYAN COLLEGE, CAMERON, MO. — A coeducational institution established in 1883 as the Cameron Institute and incorporated under its present title in 1897, under the control of the Methodist Episcopal Church. Collegiate, academic, normal, commercial, and music departments are maintained. Students are admitted to the college on completing a high school course. The degrees of A.B., B.S., and B.S. in Civil Engineering, are conferred. The enrollment in 1910–1911 was 275. The teaching staff numbers nineteen members.

MISTRESS, SCHOOL. — See Teachers, Sex of.

MITCHELL, MARIA (1818–1889). — Professor of astronomy and advocate of the higher education of women. She was educated by her father and in the private school of Cyrus Pierce (*q.v.*). She discovered a new comet in 1847, was for several years engaged in astronomical work for the United States Coast Survey, and was professor of astronomy at Vassar College from 1865 to 1880. She was the first woman elected to membership in the American Academy of Arts and Science and the American Association for the Advancement of Science. She served as one of the editors of *American Nautical Almanac*, and published several papers on scientific subjects and the question of the higher education of women. W. S. M.

MITTELSCHULE; MIDDLE SCHOOL. — A term which in Austria and Southern Germany is applied to those schools which are intermediate between the elementary schools and universities (*Hochschulen*), *i.e.* secondary schools. In Prussia and the states whose systems are modeled on Prussia, a *Mittelschule* is a type of school which furnishes a higher elementary education preparatory to the higher artisan occupations and the lower commercial and administrative positions. It is accordingly intermediate between elementary and secondary schools. This type of school originated toward the end of the eighteenth century, and has been known under many different names (*e.g. höhere Bürgerschule, Stadtschule, gehobene Bürgerschule, Rektorschule,* etc.). It was not officially recognized until the General Regulations of 1872, but even then it was not definitely organized, so that several types existed: (1) attached to an elementary school, (2) a separate school with five or six classes taking pupils from elementary schools, (3) a separate school with nine classes. The middle school is established and maintained entirely by local efforts, and receives no grants from the government. Hence the curriculum can be adapted to meet local needs. The only restriction until recently was that the teacher employed in such schools must have passed the *Mittelschullehrerprüfung* or else an examination for higher school teachers. In 1910 the middle schools were reorganized; the complete school of this type must have nine classes, but pupils may enter into the sixth class (Class I is the highest) from the elementary schools; the curriculum has been defined; and, most important, such schools may prepare for the secondary schools. Up to the present the progress of the middle schools has been retarded because, although they charged fees and kept pupils as long as the Realschule, graduation carried no privileges, and pupils could not be transferred to secondary schools. The recent regulations remedy this. See further details under Germany, Education in.

The term is not used in English to refer to any type of school, although it has been employed with reference to secondary education by Chancellor Elmer E. Brown in *The Making of our Middle Schools*, which deals with that type of education which is midway between elementary and university. In Ireland secondary schools and education are known as intermediate, although here pupils may be received from the age of nine on and the elementary branches may be taught.

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MIXED NUMBER. — A number in which the sum of an integer and a fraction is expressed. For example, $2\frac{1}{2}$ is a mixed number. The term has generally been applied to the case in which the fraction is a common fraction; but there is no reason why this limitation should be placed, since 2.5 is just as much of a mixed number as $2\frac{1}{2}$. The term is merely one of convenience in the school, and aside from its value in distinguishing the various cases that it is thought best to take up in fractions, it might well drop out of the vocabulary. The operations with mixed numbers are sufficiently treated in any common arithmetic. D. E. S.

MNEMONIC SYSTEMS. — Artificial devices for memorizing depending upon the creation of arbitrary associations. Every one at times deliberately associates some fact to be remembered with some more well-known fact, as in the case of fixing the memory of the name of a person which it has been found difficult to remember. A device of this sort which is a little more elaborate is the verse commonly used for remembering the number of days in the various months, beginning "Thirty days hath September." The early logicians made use of many such aids to memory in connection with the methods of syllogistic reasoning. Thus, the syllogistic moods were indicated by the vowels of the words of the barbarous Latin verses: —

Barbara, Celarent, Darii, Ferio, Baralipton
Celantes, Dabitis, Fapesmo, Frisesomorum,
Cesare, Camestres, Festino, Baroko, Darapti,
Felapton, Disamis, Datisi, Bokardo, Ferison.

More modern mnemonic systems apply the same principle in a more general way by the use of the figure alphabet, which is committed to memory. The one most frequently used is as follows: —

1	2	3	4	5	6	7	8	9	0
t	n	m	r	l	sh	g	f	b	s
d					j	k	v	p	c
					ch	c			z

"To briefly show its use, suppose it is desired to fix '1142 feet in a second' as the velocity of sound: t, t, r, n are the letters and order required. Fill up with vowels forming a phrase like 'tight run,' and connect it by some such flight of the imagination as that if a man tried to keep up with the velocity of sound he would have a tight run." (E. Pick, *Memory and its Doctors*, p. 8.)

Two chief objections have been brought against the use of such systems. In the first place, they are either so limited in their application or so cumbrous as to defeat their purpose. And in the second place they are purely mechanical, and thus tend to discourage logical memorizing, which is not only more useful, but has been shown experimentally to be more economical than the mechanical methods.

See Memory. E. H. C.

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MOB PSYCHOLOGY. — A special type of behavior and mental activity is exhibited by groups of persons who come together under the influence of any strong emotional excitement. Thus a community aroused by some crime is likely to behave in a fashion entirely different from any individual member of the community. The behavior of the company as a whole is characterized by lack of deliberation and lack of a feeling of responsibility. Imitation undoubtedly plays a very large part in mob behavior and in mob consciousness. The imitation here involved is likely to be relatively blind. The whole situation can be described by saying that the emotional tension is raised to a very high level, and the action which proceeds from the company as a whole is intense to a degree which would be impossible in a single individual, even if he were dominated by the same emotion. Some writers on social psychology have been led to regard the behavior of a mob as typical of all social consciousness. Emphasis should be laid upon the fact that mob behavior is distinctly characterized by emotional tension. There are many other forms of social behavior which depend upon common ideals and common plans, but are not dominated by emotional stress. General interpretation of social phenomena on the analogy of mob behavior is therefore not justifiable. C. H. J.

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MOBERLY, GEORGE. — See Winchester College.

MODE. — See Graphic Curve; Statistical Method.

MODEL LESSON. — In the training of teachers it is customary to illustrate the principles of teaching by the use of actual classroom instruction. For this reason, most normal or training schools for teachers are equipped with a special laboratory school with carefully selected teachers in charge. When there is but one such school, it provides opportunity for (1) demonstration, (2) practice, and (3) experimental teaching. In the teaching of pedagogical theory, the demonstration school is an important and necessary adjunct to reading and discussion. The critic or class teachers of the observation or model school teach before the class in theory to illustrate the various types of teaching employed in current practice. The students report their observations and discuss them, thus gaining a more concrete basis for their theoretic study. The use of model or type lessons is vastly superior to random observations by students, for they can be given for the particular purpose and at the specific time required by the instructor in pedagogical theory. H. S.

See Illustrative Lesson.

MODEL SCHOOL. — A term commonly applied to a graded school connected with a normal school, or teachers' training college. The school may be used as a real model school, and little or no practice teaching or experimental work be done in it, or it may be used as a regular training school, in which student teachers teach under direction. The term is rather loosely used. Strictly speaking, it should be used only for such schools as are models or types, serving mainly for observational purposes, the terms training school or practice school or experimental school being used for schools serving primarily for practice teaching purposes. See EXPERIMENTAL SCHOOL; NORMAL SCHOOL.

In Ireland the term "model school" is used to refer to a type of higher elementary school. The model schools when established by the Board of Commissioners of National Education aimed "to promote 'united education,' to exhibit the most improved methods of literary and scientific instruction for the surrounding schools, and to train young persons for the office of teacher" in the national schools. It was proposed to establish one in each of the thirty-two school districts, but this was never carried through. The first model school was opened in 1849. A higher education is given than in the elementary schools, and the teachers receive a higher rate of pay. Although the term has been retained, many of these schools have long ceased to serve as models, and provide an education intermediate between the elementary and secondary schools for those pupils who cannot proceed to the latter.

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MODELING. — In teaching geography in the elementary school, modeling in relief is used to fix the interpretations of flat maps. Clay, papier maché, and sand are among the materials used. Owing to its cheapness and its ready use, modeling on the sand table has been very popular among teachers. The value of such work has been the subject of considerable controversy. It has been opposed as an inaccurate mode of representing physical features, which necessarily leads to exaggeration and the fixing of false impressions. Those who favor it contend that it is merely a supplement, not a substitute for accurate map reading, its main value being found in its use as a psychological device for teaching children facts in an active and concrete way. H. S.

See FINE ARTS; GEOGRAPHY, TEACHING OF.

MODELS. — See VISUAL AIDS TO TEACHING.

MODENA, ROYAL UNIVERSITY OF. — See ITALY, EDUCATION IN.

MODERN LANGUAGE AND LITERATURE. — The modern languages as subjects of study in the higher institutions of learning take as their province the culture both old and new of the foreign peoples as revealed in their languages and literatures. In the broadest acceptation of the term it is the study of philology. For a full discussion of this discipline, particularly with regard to modern tendencies and the development of scientific methods, see under Philology. Of close relation, also, is the article on Phonetics. This article is limited to a consideration of the scope and methods of the study of these languages and literatures in the universities and schools at the present and during the very recent past.

In Universities. — *Germany.* — The scientific study of Romance languages and English in the universities of Germany is but the natural outgrowth and broader application of the philological method that began to flourish in the early decades of the nineteenth century, and is associated with such names as Grimm, Wilhelm von Humboldt, Bopp, and others. There were few chairs established in the Romance field before 1850. Halle, Giessen, Bonn, are among the earliest. All the chairs for the study of English came in the last three decades, the earliest at Leipzig and Strassburg in 1873. At present there is, even in the largest German universities, only one chair for Romance and one for English philology. Here and there a *privat Dozent* gives lectures, and the plan of having foreign lektors, usually one French and one English, has also been quite generally adopted. Berlin boasts of two English lektors, one Italian, one Russian, one Dutch, and one lektor for the Scandinavian languages.

There is a widespread feeling in Germany that the modern language departments, especially in the larger institutions, are considerably undermanned to carry on the work satisfactorily and meet the practical demands that are becoming more and more imperative. Even if the professor keeps within the field of philology, to such an extent has it grown that it is impossible for one man to cover the ground satisfactorily to himself or to his students. The German *Neuphilolog* justly prides himself upon the thorough grounding he gives his students in scientific method, in historical grammar, and in the interpretation of the older texts. To accomplish this and yet add courses in Shakespeare, Molière, to say nothing of interpreting writers nearer our own times, in whose works there is so much of truly scholarly interest, must obviously soon bring about an increase in the modern language staff.

The scholarly work is in the hands of the professor, a law unto himself as regards the courses he offers during a semester or series of semesters. For more intensive work in method with advanced students, there have been established seminars. The kind of work done in the modern language seminars varies with the personality of the director.

The English seminar at Berlin under Professor A. Brandl is a very good example of the more modern type of organization. There are three rooms for books which now amount to over 11,000 volumes; one room for phonetic apparatus, a room for conversational practice, and various offices. The doors are open freely to all, but only the advanced students are regular members, allowed to take part in the work of the seminar. In the winter semester, 1909–1910, there were 290 using the seminar, and twenty-one regular members. In order to become a regular member it is necessary to pass an examination, or the applicant must prove to the lektor that he has sufficient practical command of the language to omit the work demanded in the preliminary proseminar. Even entrance to the proseminar is safeguarded by a preliminary trial. The lektor does the practical teaching of the departments. On the whole, his work is primarily planned to give students of the university an opportunity to hear the foreign language rather than a scholarly discussion of a limited field of knowledge. His lectures deal with modern literature, or serve to orient the student in the life and customs of the foreign peoples. He also usually offers some work for small groups of advanced students in composition and phonetics. How much the lektor adds to the scholarly side of the departments concerned, depends upon his personality, training, and, doubtless, upon the attitude of the professor, as head of the department.

The following paragraph presents two types of courses. The first is very progressive. It takes cognizance of the practical as well as the more strictly philological side of the subject. Lectures in most courses are held in English by the professor as well as the lektor. The second is a more typical offering of courses found in Germany. Great stress is laid upon historical grammar, syntax, and the interpretation of old texts. The modern authors are usually treated by the lektor.

Courses offered in English at the University of Marburg during the summer semester of 1912: Introduction to the study of English Philology, two hours; Old English Literature, with readings, three hours; English Seminar, philological section: Shakespeare's *Hamlet*, one hour; Essays of Addison, one hour: English Seminar, practical section: Poetry of George Meredith, one hour; Proseminar, philological section: introduction to Old English (Prose), one hour; Practical Section: reading of Phonetic Text, one hour; England and the English (Part I), one hour; Introduction to spoken English, open to students of all faculties, two hours; Essays and Discussions, one hour.

Courses offered in the Romance Languages at the University of Göttingen during the summer semester of 1912: French Phonetics, two hours; Historical Italian Grammar, with interpretation of selections from Dante, Petrarca, Boccaccio, four hours; Introduction to Old French with exercises in interpretation, two hours; Selected topics of French Syntax, two hours; Seminar, exercises in Old French (*Erec*), one hour; Proseminar, reading and interpretation of Racine's *Plaideurs*, one hour. The French lektor gives the following courses: Modern French for beginners in two sections, two hours each; Modern French for advanced students, two hours; Alfred de Musset, two hours. Italian lektor offers: Introduction to the study of Italian, four hours; *Le Novelle della Pescara* by Gabriele d'Annunzio, reading and composition for advanced students, one hour; Italy and its People, illustrated lectures for students of all faculties, one hour. Spanish courses: Elementary course, two hours; *Doña Perfecta*, novela de Pérez Galdós, reading and composition, for advanced students.

France. — In a number of the provincial universities there is still only one professorship of modern languages. Others have one professor of English or German, the work of the second language being in charge of men of non-professorial rank, variously named *maître de courses, maître de conférences, chargé de conférences.* Only in the larger universities like those of Paris, Lille, and Poitiers do we find separate chairs for German and English. Two or three others have one full and one adjunct professor. All, however, have teachers of the modern languages. usually for both German and English, and sometimes for Russian, Italian, etc. Here and there, the German system of having lektors, native Germans and Englishmen, seems to have found favor. This, however, is not at all general.

The young man or woman who has passed the French *baccalauréat* and who wishes to specialize in modern languages has a very definite course of study to pursue in order to obtain, through public examination, the various diplomas granted by the State. The chief state diplomas are the (1) *Licence,* (2) *Diplôme d'études supérieures,* (3) *Doctorat ès lettres.* In addition to these diplomas there are, among others, competitive examinations for the *certificat d'aptitude* and the *agrégation.* The work, including the reading, demanded for these several diplomas is pretty definitely prescribed, and the courses offered in the universities are planned, very largely, to prepare students to meet the requirements. There is, consequently, great similarity in the offerings of all the universities, in marked contrast to the lack of uniformity of courses given in the various German universities. In the preparation for the advanced examinations, however, the student must evidently largely depend upon himself, the university professors and courses serving merely as guides. The candidate is also doubtless aided by the full accounts of all examinations that are found in educational journals.

The *licence* can be obtained after one year's study beyond the passing of the baccalaureate. As a rule, a longer time is necessary to prepare for this diploma. The prescribed work in modern languages is narrow in scope, with the chief emphasis upon a few books that are representative of different periods of literature. The examination is both oral and written. In addition to the general three-hour Latin examination required of all arts students, the candidate specializing in modern languages passes: (*A*) written tests in: (1) Translation and grammatical commentary, modern language, chosen by the candidate. Commentary written in the modern language, four hours. (2) Modern language theme, three hours. (3) French essay, four hours. (*B*) oral tests in: (1) Interpretation of a modern language text, together with a literary and grammatical commentary in the foreign language; (2) literary history of the modern language; (3) interpretation of a text from modern French literature; (4) any university course, at the choice of the candidate; (5) translation of an easy selection from the second modern language chosen by the candidate. About on a par with the *licence* are the competitive examinations for certificate of proficiency for modern language teaching in the various state schools.

Great stress is laid upon the candidate's ability to speak and write the foreign language, and it is usual to spend a year abroad before attending the regular university courses.

The English books chosen for 1913 for the modern language certificate for teaching in normal schools are: Sheridan, *The School for Scandal;* G. Eliot, *Adam Bede;* Kipling, *The First Jungle Book;* Wordsworth, *Michael, a Pastoral Poem;* Keats, *Isabella;* Tennyson, *The Miller's Daughter*, *The Brook*, *Dora*, *Morte d'Arthur*, *Ulysses*, *The Revenge;* Browning, *The Pied Piper of Hamelin*, *Hervé Riel*, *How they brought the Good News from Ghent to Aix;* Whittier, *Maud Muller*.

The Diploma of Higher Study can be obtained after two years at the university. It is the intermediate stage between the *licence* and the competitive *agrégation*. Greater specialization in the chosen field characterizes the work for this diploma. The candidate must prepare and defend a memoir written either in French or in the language the student offers. The examination also includes the grammatical and literary interpretation of passages from authors of the Middle Ages, Renaissance, and Modern periods, previously chosen by the candidate.

A much-coveted state diploma is the *agrégation*, which carries with it the right to a position in a Lycée, or college. The *agrégé* is the highly trained specialist in his own particular field. The École Normale at Paris, now the professional school of pedagogy of the University of Paris, is closely associated with the name *agrégation*. The competitive examination is, however, open to all those who possess the prerequisite training. It requires at least three years beyond the baccalaureate to pass the *agrégation*. As only a certain number can pass each year, depending on the demand for teachers of this grade, even good candidates try four or five times before meeting with success. The work in preparation for the *agrégation* is pretty definitely outlined, and, to a certain extent, the courses given at the university meet the needs of candidates. Practice teaching in a Lycée, and special classes at the École Normale supplement the regular university courses in subject matter. Independent work under supervision occupies the better portion of the student's time, particularly at the later stages of preparation.

In addition to the teaching qualifications the written requirements are: — (1) An essay in French on some topic dealing with the literary history of the foreign people, seven hours; (2) essay in the foreign language dealing with the history of civilization of the foreign people, seven hours; (3) translation from and into the foreign language, two papers, four hours each. The oral test includes a lesson given in French and one in the foreign language after five hours' preparation, three quarters of an hour; a half-hour test of the candidate's practical knowledge of the spoken language.

The books chosen for 1912 upon which the various papers are set are: —

I. The vision and the dream in English literature. Chaucer, *The House of Fame*, Books I and II. Shakespeare, *A Midsummer Night's Dream*. Macpherson's Ossian, *Fingal*, *Carthon*, *The Death of Cuchullin*. Byron, *The Dream*, *Darkness*, *The Vision of Judgment*. R. Kipling, *The Finest Story in the World* (Many Inventions), *The Brushwood Boy* (The Day's Work).

II. Biblical influence on English literature and society. Judith (Sweet's Anglo-Saxon Reader); The Revelation of St. John the Divine (Authorized version of 1611). Milton, *Paradise Lost*, Books VII and VIII. Bunyan, *The Pilgrim's Progress*. W. Hale White, *The Autobiography of Mark Rutherford*, *The Deliverance of Mark Rutherford*.

III. Criticism of contemporary English society. Carlyle, *Latter-day Pamphlets*. Ruskin, *Sesame and Lilies*. Chesterton, *Orthodoxy*. Galsworthy, *The Island Pharisees*. As examples of the topics set at the oral examination of the English *agrégation* for 1911: French lessons: Treatment of Nature in *The Tempest;* The humor of Wells. English lessons: comment on the versification of the *Knight's Tale*, line 1363 to line 1439; the manners of the Restoration as illustrated by the *Way of the World*.

There is a state *Doctorat ès lettres* and one primarily for foreign students granted by the University. The state diploma is usually taken several years after the *licence* or even the *agrégation*. Two theses are required, one in French and the other either in French or the foreign language. They are mature and scholarly contributions to the subject, corresponding to the doctors' dissertations accepted by the best American universities. To gain the University diploma requires four semesters' enrollment and a thesis either in French or Latin. There is, in addition to the public defense of the dissertation, an examination on university courses.

The following German courses were offered at the University of Paris during the year 1911–1912: Language and Literature. M. Andler, Professor, director of studies. Public Course: Intellectual geography of Germany in the nineteenth century, one hour. Conferences: (1) Historical syntax of modern German, one hour; (2) exercises in syntax in preparation for the *licence* and the *certificat d'aptitude*, one hour; (3) consultation with students, one hour. Reception of students of modern languages, one hour. M. Lichtenberger, Adjunct Professor. Conferences: (1) History of the German language, one hour; the legend of the Grail, one hour; (2) explanation of texts of Middle High German, one hour; (3) lessons in preparation for the *agrégation*, one hour. M. Rouge, Maître de Conférences. Conferences: (1) Heinrich von Kleist, one hour; (2) correction of work and explanation of texts, one hour; (3) exercises in preparation for the *licence*, one hour. M. Basch, Chargé de Cours. Conferences: (1) Religious and moral philosophy of German Romanticism, one hour; (2) practical exercises, one hour; (3) history of German literature in the eighteenth century, one hour.

England. — Work in modern languages in the older universities of Oxford and Cambridge is, on the whole, but a generation old. To be sure, as early as 1778 Sir Robert Taylor bequeathed £189,000 to the University of Oxford for the establishment of an institution for the teaching of modern foreign languages. The Taylorian Institute, however, did not come into existence until 1845, and the first professor of modern European languages was chosen three years later. Max Müller succeeded the first incumbent, but after he became Corpus Professor of Comparative Philology in 1868, the professorship lapsed and Taylorian teachers of French, German, Italian, and Spanish were appointed instead. It was not until after the establishment of the honor school of modern languages that appointments were again made, one professor of German in 1907, and one of French in 1909. At present there are also a professor of Russian, about nine or ten lecturers or readers, and about an equal number of tutors and teachers connected with the Women's Colleges and Halls. Cambridge celebrated in 1909 the twenty-fifth anniversary of the founding of the Medieval and Modern Languages Tripos, and in that same year appointed the first professor of German. At present there is a reader of French. Four lecturers also give instruction in modern languages exclusively, and a number of recognized women teachers.

The other modern English universities, such as London, Manchester, Liverpool, etc., have about the same strength and organization of teaching staff as the German universities. As the work in modern languages required for the pass and honor degrees in the various English universities does not differ essentially, a description of the status of modern languages at Cambridge will be given.

A Cambridge man may take a degree with no knowledge of a modern language at all. Since 1886, however, German and French form two of the three so-called additional subjects, one of which must be passed at the "previous examination" or entrance examination. As French is the language usually taken in the boys' schools fitting for college, there is a dearth of young men coming to the university well grounded in German. The percentage of young women that have had both languages is very much higher. Attempts to induce the authorities to allow German as a substitute for Greek have thus far failed. A certain amount of specialization in the modern languages may be done even by students who go in for the ordinary B.A. degree by preparing for the special examinations in English and German, or English and French. These examinations are comparatively easy and consist of translation and composition based upon prescribed books. Some of the work is voluntary. No oral examination is at present required. Candidates can, however, obtain recognition for their practical command of the foreign language by taking the oral test held for honor degree students. The prescribed books in French and German for 1911 were: French: Racine, *Athalie;* Marbot, *Mémoires*, vol. 2, cc. 1–26; (voluntary) *Extraits de la Chanson de Roland;* Molière, *Les Femmes savantes;* Bossuet, *Oraisons funèbres.* German: Gutkow, *Zopf und Schwert;* Tieck, *Ein Dichterleben;* Fulda, *Der Talisman;* (voluntary) Hartmann von Aue, *Der Arme Heinrich;* Uhland, *Ernst von Schwaben;* Hebbel, *Agnes Bernauer;* Liliencron, *Anno 1870.*

Most students especially interested in modern languages prefer to go in for the Medieval and Modern Languages Tripos, corresponding to the Honor Schools at Oxford. As at present constituted, there are ten sections, six of which deal with the modern literatures of England, France, Germany, Italy, Spain, and Russia. Four emphasize older periods and philology. (English and Germanic, French and Romance, and German and Germanic.) A candidate for an honor degree in modern languages must pass in any two of the above sections. It is possible for him, therefore, to do all his work in one language or divide his time between two, if he so desires. Other combinations can be made with subjects outside the modern language field, with history, the classics, etc. Both sections may be passed off at the end of the third year, or one may be taken at the end of the second and the other at the end of the third. The examination in the "German" section tests the candidate's ability to translate into the foreign tongue, to write a German essay on some topic bearing upon the literature, history, or institutions of Germany. There are papers on the general field of literature since 1500 and on some special modern period, and also on the history of the German language, the elements of historical German grammar, and on meter. The examination on the "Old German" section is more strictly philological in character and serves to test the candidate's knowledge of the language and literature previous to 1500. The courses given at both Oxford and Cambridge are in general plan of organization very similar to the modern language courses found in the various German universities. In recent years more attention has been given to the literary side of the field. The aim has, however, always been to make the work of the tripos as sound philologically as the time and conditions permit. The practical and modern side of the student's training must be obtained largely through residence abroad before or during the university course. An oral test now forms a regular part of the examination at both Oxford and Cambridge. But it is possible, at least at Cambridge, for one to pass the tripos without satisfying the examiners in the oral command of the language. In both places, however, the names of successful candidates in the *vive voce* test are especially distinguished in the published class lists. During the first twenty-five years since the establishment of the Medieval and Modern Languages Tripos, 567 took honor degrees in Modern Languages at Cambridge. Of these 230 were men, and 337 women.

The older English universities do not confer degrees taken in courses beyond that of B.A. But both Oxford and Cambridge offer opportunities for work to advanced and research students under certain conditions. The degree of M.A. in the University of London can be taken in the several modern languages and literatures by those who have already passed the B.A. honors examination. It is an examination in both language and literature and includes: (1) a thesis; (2) a written examination; (3) a *vive voce* examination, especially on the subject of the thesis. The written portion of the examination consists of general questions to be treated in the form of an essay and translation of texts chiefly chosen from early periods, with commentary. The following courses were offered at Cambridge during the year 1911–1912. The foundations of modern German Literature, 1800–1850; Goethe's *Faust* I; Historical German Grammar; Modern German Seminar, Advanced German Composition; Old German Seminar, History of the German Language; Old High German; German Historical Grammar; Introduction to Middle High German Translation (with papers), Kudrun and Walther von der Vogelweide. Special subjects and books announced for the German section of the Modern Languages Tripos, Cambridge University, for 1912 are as follows: Paper (4) Walther von der Vogelweide. Das Niebelungenlied (Sammlung Goeschen), pp. 27–99. Braune, Althochdeutsches Lesebuch, xvi, 7–11; xvii; xxx; xxxii, 10–12; xxxiii; xxxiv; xxxvi; Paper (5) (special subject): The historical drama in connection with Lessing, Goethe, Schiller, Kleist, Grillparzer, Uhland, Wildenbruch, Saar. Paper (6) Luther (Sammlung Goeschen). Goethe: Poems, *Iphigenie, Faust.* Schiller: Poems of the third period, *Die Braut von Messina.* Uhland: Ballads. Consbruch und Klincksieck, Deutsche Lyrik des neunzehnten Jahrhunderts.

Special subjects and books announced for the Old French and Provençal section, the Modern Languages Tripos, Cambridge University, for 1912. Paper (2) (special subject): French literature in the reigns of Louis VII, Philippe Auguste, and Louis VIII, in connection with Aliscans; Chrétien de Troyes: Lancelot; Guillaume de Dole; Aucassin et Nicolette; Villehardouin, La conquête de Constantinople; Le Mystère d'Adam. Bartsch et Horning, La langue et la littérature françaises depuis le IXème siècle jusqu'au XIVème siècle, pp. 101–394 and 399–408. Paper (4) Bertran de Born; Flamenca; Appel: Provenzalische Chrestomathie.

England. — The status of modern foreign languages in English schools of secondary grade is still in the making. Among the factors that have retarded their growth are: (1) Lack of any national system of public instruction before 1902; (2) The influence of the older Universities and Public Schools — strong bulwarks of classical training; (3) Until a few years ago, the overemphasis of science and art subjects in non-endowed schools, in order to obtain State grants of money, and the consequent neglect of the humanities; (4) The attitude of the Board of Education towards modern languages, its insistence upon Latin as one of the two foreign languages taught in every school. In the most recent circular, however, it has taken a more liberal attitude and has yielded so far as to say that provision for the study of Latin need not be made in every school, but only in one out of every group of schools. The present ratio of pupils taking French to those taking German is about five to one. Since it is usually only possible for pupils to take two foreign languages of which Latin either must be, or almost invariably is, one, German goes to the wall. Indeed many feel it is in a state of serious decline.

According to the *Report* on the conditions of modern language teaching presented in 1908 at the meeting of the Modern Language Association, the average age of pupils beginning French was 11; of 98 schools of the local type reporting, 74 began French first, 4 schools Latin, and 20 began the two languages simultaneously. German, if studied at all, is taken up at 14. This gives little time to the study of this language where the leaving age is 16 or 17. Four or five 45-minute lessons a week are quite usual for the foreign language.

The teaching has shown great improvement in recent years. In the past, particularly in the Public Schools and the numerous private schools, the scanty instruction was in the hands of a foreigner who was, far too often, treated as an outsider in the social scheme. Today there is an increasing number of men and women — trained at the universities or by study abroad — who have done much to put modern language work in a better strategic position. Within the past ten years or so, the principles of the German reform method have found many advocates. The Modern Language Association with its excellent organ *Modern Language Teaching* has been a powerful instrument in arousing apathetic official boards and in creating public interest in the cause, and particularly in threshing out and adapting the so-called "direct method" to English conditions. Judging from the report of the committee referred to above, reform teaching has already made considerable headway especially in the elementary stages of instruction. The various university and other examining bodies that play such a rôle in English education have also begun to set papers more in keeping with modern aims of foreign language teaching.

For fuller discussion of this subject in the English schools, see Public Schools, English; also Grammar Schools.

United States. — Until the Revolutionary war, American colleges, as a rule, followed about the same course of study as was found in the universities of the mother country. Latin and Greek, Hebrew, some logic and philosophy, rhetoric, elementary mathematics, and physics were regarded as ample. French is recorded as an extra study about the middle of the century at Harvard. The program of senior study of 1756 at the Academy at Philadelphia (later the University of Pennsylvania), permitted French to be studied at leisure hours. The first professorship of French seems to have been established at the College of William and Mary in 1779, with the radical reorganization of the curriculum brought about by Thomas Jefferson. Students at Harvard, not preparing for the ministry, could substitute French for Hebrew in the 80's of the eighteenth century. But for a good many years the advance made by French and, later, German, in the colleges was extremely slow. It was an extra subject, occupying an inferior position in the same list as music, fencing, etc., to be paid for extra, and not permitted to interfere with the stated academic duties. George Ticknor was made Professor of French, Spanish, and Belles Lettres at Harvard in 1816. With his name is closely associated the term "elective system," which much later came to play such a rôle in the organization of the work of all higher education in America. The modern languages acted as the first entering wedge in the attempt at breaking up the rigid curriculum of the past. Ticknor organized his department on the elective basis, but his attempts to develop and extend the elective system met with severe opposition at every turn. In 1825 the University of Virginia opened its doors, and modern languages formed one of the ten schools comprised in the plan. In six months the modern language school was second in numbers after mathematics, and larger than the school of ancient languages. In the same year, due to the influence of Ticknor, Carl Follen was appointed Professor of German at Harvard. In 1828 Henry W. Longfellow began, as instructor at Bowdoin, to teach French, Spanish, Italian, and German, to members of any of the four classes who chose to elect the courses. The position of the modern languages in other colleges at the time is very similar.

Very little progress was again made for over a generation in modern language studies until, in fact, the idea of elective studies again rapidly spread during the period of the presidency of Charles W. Eliot at Harvard. At present, the modern languages are among the largest departments in the Colleges of Arts. The more important universities maintain large staffs of instructors. At such universities, for example, as Harvard, Columbia, Chicago, and Wisconsin there are twenty-five or more giving instruction in the Germanic and Romance departments.

At the present time many colleges demand a ready knowledge of French or German, or both, for the several degrees, although there is by no means uniformity except in colleges exclusively for women. As late as 1896–1897, of 432 institutions only 14 per cent required a modern language for the B.A. degree; of 123 institutions 41⅗ per cent required a modern language for the Bachelor of Philosophy, the modern language being in lieu of Greek. Similar percentages are shown in the requirements for the degrees of B.S. and B.L.

The present high school course usually equips the pupils with a knowledge of Latin and one modern language, French or German according to choice or environment. Large numbers, therefore, take as prescribed work in their freshman year, the modern foreign language required for the degree which they did not offer for entrance. This elementary work in modern languages has become a great burden for the colleges to bear. Particularly in the smaller colleges there is neither time nor opportunity for the staff to offer much beyond what might well have been done in high school classes. Even in the larger universities the beginning classes contain a large percentage of the total number of students in the department.

Still, in a few colleges that require French or German, or both, for the B.A. degree, the student can prepare himself by private study if he so chooses. At Bryn Mawr, for example, five-hour courses throughout one year are provided, but until the junior year attendance is not obligatory, the student being free until then to complete the work by herself. Harvard also allows the student to pass off any deficiency in French or German before the opening of the second year in college.

For undergraduate students wishing to specialize in modern languages, there is given considerable range of opportunity in the large institutions of the country, either through the system of majors and minors, the group system, or honor degrees, etc. To obtain honors in Romance languages and literatures at Harvard, for example, the student " must have taken five courses in the department, only one of which may be of an elementary character. He must be able to read two of the Romance languages and to write one of them with readiness and correctness. He must present a thesis and pass an examination orally and in writing on the general field covered by the studies."

At the University of Chicago, the student interested in German must take, for the degree of Ph.B., " at least nine coherent and progressive majors (a major being a course which meets four or five hours weekly throughout one quarter year)."

At Bryn Mawr, the special work in modern languages must include two major courses of five hours a week for two years in any one of the fifty-five groups. By taking " any language with any language " the student is offered a wide field of choice. It is also possible to combine one foreign language with some other field, such as history or comparative literature, etc.

At Columbia, candidates for the A.B. degree who wish to specialize to a certain extent in German, for example, can elect this language as one of the two sequences required for graduation. They would then take courses in the department for a period of three years "aggregating at least eighteen points beyond the elementary requirement for admission. (A point is credit for satisfactory completion of work requiring attendance one hour a week for one half year.)" Honor students must have high standing in two or three sequences and also do considerable supplementary reading. A final examination, both written and oral, is set, covering the entire field of honor work. Honor students would, after the three years, have gained a knowledge of the history of German literature and have taken general and special courses dealing with the classical period and later writers of the nineteenth century. The collateral and supplementary reading at present required consists of above 5000 pages of literary texts representative of the different periods of the literature.

In the elementary work of the colleges the same textbooks are generally used as in the high schools, and doubtless the same variety of method employed. The maturity of the students, many of whom are already too old to begin a modern language, and the fact that it is often prescribed and dropped at the end of the year, probably force college instructors to follow traditional lines of teaching. The lack of uniformity in the preparation given to the students in high school also makes for conservatism in college methods of instruction. The so-called higher courses are very often largely translation courses combined with some literary interpretation. In recent years, however, much more attention has been given to the practical side, and in most of the better colleges there are courses in oral and written composition, either given as separate courses or in connection with some literary course. In a number of institutions, notably in colleges for women, almost all the work of the department is carried on in the foreign language. In still others some of the staff regularly give their lectures in German or French. The undergraduate work is largely literary in character. In the courses primarily for graduates there are in addition to the more specialized literary courses a number which aim to give the student some knowledge of philology and historical grammar. Stress is also laid upon the older periods of the language and literature, and in some institutions modern related languages are taught. The group, Scandinavian languages, for example, is often included in the work of the Germanic departments, although in a few institutions a separate department for these languages has been created.

The more important universities have well equipped libraries, both general and special, for advanced students.

The following is a list of undergraduate courses given by the Romance Department of Adelbert College, Western Reserve University, for 1911–1912, though not all are given in any one year.

In French: Elementary Courses; The Classic Drama (Corneille, Racine, Molière, Voltaire); Prose Writers of the Seventeenth Century (Pascal, La Bruyère, Bossuet, Sévigné); Prose Writers of the Eighteenth Century (Montesquieu, Voltaire, Diderot, J. J. Rousseau); Drama of the Eighteenth Century (Marivaux, Le Sage, Regnard, Beaumarchais); The Romantic School (one of above four sections given each second half-year). Literature of the Sixteenth Century (Montaigne, Rabelais); Outlines of the History of French literature to the end of the Sixteenth Century; Historical French Grammar; French Grammar; History of French Literature.

In Italian: Elementary Course; Dante.

In Spanish: Elementary Course; Reading of Modern Prose and Plays; The Classic Drama; Cervantes.

The following is a list of graduate courses offered by the Romance Department of Harvard University for the year 1911–1912, or alternate years.

French: (for undergraduates and graduates) General View of French Literature; Literature in the Nineteenth Century; Literature of the Eighteenth Century; Literature of the Seventeenth Century; Literature of the Sixteenth Century; The French Drama in the Nineteenth Century; Literary Criticism in France, with special reference to the Nineteenth Century; Rousseau and his Influence.

(Primarily for graduates) Old French Literature; French Literature in the Fourteenth and Fifteenth Centuries ; Historical French Syntax; French Prose in the Sixteenth Century; Studies in the French Drama of the Seventeenth Century; Studies in French Drama of the Nineteenth Century.

Italian: (for undergraduates and graduates) General View of Italian Literature; Modern Italian Literature; Italian Literature of the Fifteenth and Sixteenth Centuries; The Works of Dante. (Primarily for graduates) Italian Literature of the Thirteenth and Fourteenth Centuries; The History of the Novel and Tale in Italy and Spain from Beginning of Medieval Period to the Eighteenth Century.

Spanish: (for undergraduates and graduates) Spanish Composition and Conversation; General View of Spanish Literature; Spanish Prose and Poetry of the Eighteenth and Nineteenth Centuries; Spanish Literature of the Sixteenth and Seventeenth Centuries; Spanish-American Poetry. (Primarily for graduates) Early Spanish.

Romance Philology: (primarily for graduates) Old French ; Provençal ; Low Latin; Portuguese; Anglo-French and the French Element in English. Course of special study: Investigation of Special Subjects in Romance Philology.

Seminary: Meetings every three weeks, for the discussion of theses, etc. In 1911–1912 attention will be given to the history of French words in English.

Secondary Schools. — The study of modern languages in the schools was largely developed during the nineteenth century. Before that period school instruction was not very widespread, nor were the foreign languages given anything but a very minor place in the school program.

Germany. — Although Germany was much in advance of other countries, the introduction of French into the schools did not begin to make any headway until the eighteenth century. Before that time its study was confined to private instruction or to the schools attended by the upper classes (*Ritterakademien*). (See ACADEMIES, COURTLY.) By the beginning of the nineteenth century, however, most Prussian gymnasiums offered French as an optional subject. Owing to patriotic reasons, it was banished from the schools in 1816, to be taken up more vigorously a few years later. In 1831 French became obligatory in Prussia, beginning in *Tertia.* Other states followed later, Saxony in 1846, Bavaria in 1854. The study of English was much slower in its development. The relations between the countries were in earlier times not strong, but were kept alive by trade, traveling, and, notably, beginning with the middle of the eighteenth century, by the increased interest in English literature. It was, however, not until as late as 1859 that English was made obligatory in the Realschulen of Prussia, although of course it had been gradually introduced in the schools during the first half of the century. Since the refounding of the German Empire, and particularly during the last two decades, the study of English has made rapid advances. In 1900 an imperial edict allowed the substitution of English for French in the three upper classes of the gymnasium (OII, UI, and OI), French remaining an optional subject. It also made possible the substitution of other subjects for Greek in UIII, OIII, and UII, in which case three of the six hours are given to English, and the other three are distributed between French and mathematics and the sciences.

The method of modern language instruction in Germany has, from early times, swung between two poles, — the synthetic and the analytic. Both types of instruction have existed at all times side by side, although, during the first half of the nineteenth century, the method employed in the schools was on the whole synthetic, and a close imitation of the severely grammatical procedure employed in the teaching of Latin and Greek. This was due in part to a great lack of properly trained teachers, for the universities were late in establishing chairs of French and English, the majority coming after 1850. The new facilities for study produced in time an organized and well-schooled body of modern language teachers. Particularly during the last generation have great changes and progress been made toward better ways and means of teaching the subject, so that at the present time no country equals Germany in the excellence of its modern language instruction. The method now widely employed, often called the direct method, is analytic in character, and is a revolt against the older formal grammatical procedure. The chief points are as follows: Reading occupies a central position in the work in place of grammar, and is selected so as to give pupils a clear idea of the life, thought, and civilization of the foreign people. In all stages, but particularly in the earlier, great emphasis is laid upon oral practice. Indeed, the emphasis upon the spoken language and upon written exercises growing out of the oral work is a salient characteristic of the method. Translations from and into the vernacular cease to be any longer a regular exercise. Grammar study is reduced to essentials, and taught largely inductively. This, in general, represents the plan of the more radical reformers. The more conservative, forming probably the majority, still favor the retention of translation, and greater emphasis upon the grammatical course.

The work, particularly of the more advanced reformers, has been the subject of much criticism, especially in the last decade, partly because of its too utilitarian tendencies, and partly because of the general instability of pupils' knowledge, mainly on the formal side. The movement, however, represents a great step forward both in aim and practice. Modern language method has never been as efficiently and rationally organized with the idea of giving power to the pupil to use the foreign language either in reading, writing, or speaking.

FRENCH INSTRUCTION IN PRUSSIAN SCHOOLS

	VI	V	IV	UIII	OIII	UII	OII	UI	OI	TOTAL
Gymnasium	—	—	4	2	2	3	3	3	3	20
Realgymnasium	—	—	5	4	4	4	4	4	4	29
Oberrealschule	6	6	6	6	5	4	4	4	4	47
Realschule	6	6	6	6	6	5	—	—	—	35
Reform Gymnasium and Reform Realgymnasium with common foundation	6	6	6	3	3	2	2	2	2	32
						4	4	3	4	39

ENGLISH INSTRUCTION IN PRUSSIAN SCHOOLS

	VI	V	IV	UIII	OIII	UII	OII	UI	OI	TOTAL
Gymnasium	—	—	—	—	—	—	2[1]	2	2	6
Realgymnasium	—	—	—	3	3	3	3	3	3	18
Oberrealschule	—	—	—	5	4	4	4	4	4	25
Realschule	—	—	—	5	4	4	—	—	—	13
Reform Gymnasium	—	—	—	—	—	—	2[1]	2	2	6
and Reformgymnasium with common foundation	—	—	—	—	—	6	4	4	3	17

GIRLS' HIGHER SCHOOL	X	IX	VIII	VII	VI	V	IV	III	II	I	TOTAL
French	—	—	—	6	5	5	4	4	4	4	32
English	—	—	—	—	—	—	4	4	4	4	16

[1] Optional.

France. — German and English are the modern languages most studied in the French public schools, instruction in Spanish and Italian being confined almost exclusively to places near the borders of the respective countries. Of the two languages German is chosen more frequently in the boys' schools. This is partly due to the fact that it is required for entrance to the military school at Saint-Cyr and the *École Polytechnique.* English is more favored in the girls' schools.

Instruction in the modern languages was made optional in *lycées* and colleges in 1821, though but little weight was attached to their study, and but meager time allowed. In 1838 the study became compulsory in the classical course, and in 1847 in the "modern" course. In 1880 modern languages were studied in every class, with a total of twenty-nine hours per week. The kind of instruction, and the results obtained were, however, unsatisfactory. Translation from and into the foreign tongue, and much formal grammar were the chief means employed almost everywhere, even as late as 1896, although the ministerial instructions of 1890 were in theory in advance of any of the German official regulations of about the same time. The provinces in particular were very backward. The reform, which had already been in progress a dozen years or more in Germany, had as yet made scarcely any impression upon the work in France. In 1902, however, the whole subject of modern language instruction was radically changed. The aims and practices of the advanced German reformers were taken over, stock and barrel, and formulated in the instructions of the 15th November, 1901. Since that time most earnest attempts have been made by the government and the teachers to carry out the new radical program, and apparently with considerable success.

After six years' trial it was found necessary to be more conservative in the work, particularly in the upper classes. The new instructions of 1908 confirm and strengthen the plan of work done in the lower classes. For the fifth and fourth classes translation into the mother tongue, not mentioned in the earlier instructions, is suggested as a means of control in addition to the study of the reading text by exercises in the foreign language. The chief changes, however, are made in the instructions dealing with the work of the second and first classes. The earlier program emphasized reading material dealing with the life, civilization, and history of the literature of the foreign people; the new lays stress entirely upon literature, pure and simple. Moreover, one of the chief exercises of the last period is the cultivation of the art of translation into the mother tongue. These changes, however, are very slight on the whole. France leads the world, officially, in the advocacy of the radical direct method of modern language teaching.

Modern languages may now be studied for eleven of the twelve years in the French *lycées* and colleges for boys. In the second year of the preparatory division and in the eighth and seventh forms of the elementary division the subject is very inadequately represented by two hours for each. Attempts to eliminate the study and to defer the regular instruction until the sixth form have thus far failed. In the following four forms, constituting the first cycle, one modern language is studied five hours per week in each of the four years. In the first two forms of the second cycle the number of hours devoted to modern languages depends upon which of the four possible groups of courses or sections the pupils elect to pursue. The following is a table for these two years: —

	SECTION A	SECTION B	SECTION C	SECTION D
	Latin and Greek	Latin and Modern Language	Latin and Science	Science and Modern Language
Modern Language	2	3 4[1]	2	3 4[1]

[1] Second language begun and continued.

In the highest form there is a twofold division into the philosophy and mathematics forms, each with two sections, A and B.

	PHILOSOPHY		MATHEMATICS	
	Section A	Section B	Section A	Section B
Modern Languages	2[1]	1 2[2]	2	1 2[2]

[1] Optional.
[2] Pupils have the right as to distribution of these hours.

The modern language course in girls' secondary schools is begun in the infant class and continued as an obligatory study throughout all the nine years. In the last two years a second modern language may be taken. The following is the number of hours per week in each of the classes: 2½, 2½, 2½, 2½, 3, 3, 3, 3 (2)[1], 3 (2).[1]

The following is the number of hours given to modern languages in the usual three classes of the French higher elementary schools, the *écoles primaires supérieures* and *écoles pratiques de commerce et d'industrie.*

BOYS' SCHOOL	I	II	III
General Course } *école supérieure*	3	3	2
Commercial Course } *école supérieure*		4	4
Commercial Course (*école pratique*)	6	6	6
GIRLS' SCHOOLS			
General course (*école supérieure*)	3	3	3
Commercial Course (*école pratique*)	4½	4½	4½

United States. — The modern languages were late in getting a foothold in the program of studies of schools in the United States. There were sporadic attempts at teaching French in the East during the early nineteenth century; but it was not until the second half that its study was at all general. The first mention of German in a Massachusetts' high school is in 1854. German, however, appeared in the Cincinnati public schools as early as 1840, and in general thrived, particularly in parts of the Middle West and other centers where a large German population had settled. It was not until 1875 that a modern language was required for admission to college. Since then the growth in the study of the modern languages has been steady, so that in the period 1890–1910 no subject showed such a high percentage of increase. The study of French advanced in the public schools from 5.84 per cent in 1890 to 9.90 per cent in 1910; German over the same period from 10.51 per cent to 23.69 per cent. The study of Spanish is confined largely to the Western Division of states. In other parts it is pursued only by a few pupils in the larger cities. Statistics were first given for 1909–1910 in the *Report of the United States Commissioner.* The percentage for the whole country is .65 for the combined statistics of public high schools and private high schools and academies. Colorado and California lead, with 17.67 per cent and 8.49 per cent respectively.

In the country at large the study of modern languages is restricted to the secondary school, with courses of one, two, three, and four years' duration. The two-year courses are probably by far in the majority, to meet the college admission requirements, although in the larger cities and towns three- and four-years' courses are very common. The Ohio statistics for 1910 show that of 312 high schools reporting German 60 offer a four-years' course, 29 a three-years', 120 a two-years', and 6 a one-year course.

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[1] Second language optional.

The geographical distribution of pupils studying French and German in secondary schools shows remarkable variations. In general, the North Atlantic Division leads in the percentage of pupils studying both French and German in 1909–1910, with 27.56 per cent as against 11.50 per cent for the rest of the United States. Again, the New England states lead in the percentage of those pursuing French, with 41.21 per cent as against 6.44 per cent for the rest of the United States. On the other hand, the same states are below the average for the United States in the percentage of pupils studying German, 17.21 per cent as against 23.69 per cent for the country as a whole. As an example, also, of the great variation in the study of the two languages in different states, 49.09 per cent of pupils in the New Hampshire secondary schools study French as against 0.69 per cent in Indiana. New Jersey leads in percentage of pupils pursuing German with 41.39 per cent, while the percentages for South Carolina, Louisiana, and Mississippi are 0.34 per cent, 0.72 per cent, and 1.69 per cent, respectively.

It is only in some few centers of the Middle West that there is at present any serious attempt at maintaining the study of German in grades of elementary schools. Milwaukee and Cincinnati are the two great strongholds. In the latter city, if the parents wish it, one half of the time of instruction may be given in the German language up to the fourth grade. The study is then continued throughout the eight grades, but with a reduction in the amount of time.

On the whole, modern languages were, and are still, taught in schools to far too great an extent in much the same spirit and manner as Latin. But owing to ill-equipped teachers and to the shorter length of the courses, the work done in modern languages was only a poor imitation of the kind of work done in the traditional Latin course. Standards were either lacking or were to a large extent controlled by the requirements for admission to college. The course consisted of formal drill in grammar, though lacking in real thoroughness, followed or accompanied by hasty translation into and from the mother tongue, of material often badly graded as to difficulty.

The *Report*, published in 1898, of the Committee of Twelve, appointed by the Modern Language Association, has been of great assistance in fixing standards of modern language instruction in the schools. The method favored by the committee was on the whole the so-called reading method; that is, copious reading of graded texts hand in hand with the study of grammatical essentials. But the committee also advised, particularly in the longer courses, the introduction of some oral work, and other practices of the German direct method. Three grades of attainment were defined in the *Report*, and reading texts for each suggested. The elementary grade, reached normally after two years of study, represents the minimum requirement now usually set for entrance to college. The work of the two higher grades, the intermediate and the advanced, is intended to take one and two years' longer study than the elementary. (See COLLEGE ENTRANCE REQUIREMENTS IN MODERN LANGUAGES.)

Within the past few years, the more progressive teachers, stimulated by the results obtained by the Reformers in Germany, have been trying to adapt to local conditions some of the aims and methods employed abroad. More attention has been given to oral work, and to teaching pupils freer and better control of the language in general. The greatest obstacle to rapid progress, however, is bad teaching, for outside the large city systems there are far too few special teachers possessing adequate knowledge of the subject, and specially trained in methods of presentation.

Aim and Methods of Teaching. — Modern languages are studied in the secondary school primarily for their practical value. Through the choice and study of material a cultural value is added. Moreover, the processes involved in learning a foreign language are conceded to be disciplinary in their effect; they serve to clarify, deepen, and broaden one's knowledge of language in general as a vehicle of thought. The practical goal sought in the course may be regarded from at least two points of view. We may stress the utilitarian side, the practical oral control of the language, allowing the reading of books to appear as a natural outgrowth, or we may make reading the chief aim. The first way might seem upon the surface both a desirable and a logical one to pursue. Yet experience teaches us that the school is not a favorable place for the acquisition of a language technique commensurate with the energy that would have to be expended and for which there is not sufficient time. The field of reading, on the other hand, is not only broad and cultural, but the kind of work required to teach pupils to read successfully, is quite in keeping with school conditions. Moreover, the ability to read a language is more likely to be of permanent practical value than any conversational knowledge that might conceivably be gained in school classes.

Pronunciation. — The importance of teaching the foreign sounds correctly in the early weeks of the modern language course cannot be too strongly emphasized. The work should largely be upon an imitative and oral basis, the teacher acting as model. It is also important that he possess a working knowledge of phonetics. This will insure the right attitude toward this element of the course, and enable him to diagnose and correct mistakes wherever imitation is insufficient as a guide. Whether the pupils themselves shall be taught phonetic terminology and the foreign sounds at first by means of transcribed texts is a moot question. There are good arguments both for and against, particularly when dealing with a language like French. In any case, it is fundamental that there should be abundant practice in hearing and uttering the sounds of the new language.

Oral Practice. — Although intelligent reading is the chief end sought, a great deal of attention ought to be given to work in hearing and speaking, because of their very positive value in classroom procedure. In general, emphasis upon the spoken word makes for greater flexibility in the treatment of the material. It is stimulating both to teacher and pupil. Imitation and repetition are fundamental means of acquiring a new language, and if oral exercises in the foreign tongue are employed with judgment, there is no kind of work which allows and suggests to the teacher greater abundance of repetition, and hence tends to make right associations habitual. Moreover, the constant use of the foreign language in the classroom in the form of commands and well-directed questions and answers, favors the formation of a *Sprachgefühl*, or language sense, an indefinable though undoubtedly a potent factor in the acquisition of a foreign language. The amount of time to be devoted to work in speaking cannot readily be determined. In general, however, practice seems to favor greater emphasis proportionally during the elementary stage, at a time when a great deal of drill is necessary to acquire the grammatical forms and a working vocabulary. But throughout the course it should be the rule to have regular oral practice carefully graded and coördinated with all other elements of the course. Only in this way can we be assured that it shall be beneficial in the work. The scope of work in speaking and its distribution in the different years of the course, its relation to other elements such as reading and grammar, have not as yet been satisfactorily worked out, particularly for the later stages. Adequate books and specially trained teachers are still lacking.

The earliest material will probably best be selected from objects in the immediate environment; and wall pictures, if judiciously employed, will be of great assistance in planning the elementary work. The bulk of the material for the secondary school, however, should be chosen from connected reading texts. In the elementary stages these will consist of simply constructed texts or natural texts that are rich in certain grammatical forms or vocabulary. Later the regular annotated stories, etc., may be made the basis for conversational practice. Still, for many reasons, chief among which are that the reading texts may not lend themselves to conversational treatment, that the vocabulary may be too uncommon or too highly literary in character, and above all, that the selections may be too difficult, it would seem advisable on the whole to have separate texts for conversational practice, carefully organized as regards vocabulary, content, and form. Graded material dealing with foreign life and customs is suggested.

Work in speaking may be roughly divided into two kinds: (1) highly formal in character, (2) a more natural kind, which emphasizes the thought as well as the form side of the material. The first kind will consist of various changes in the sentences read, in person, number, tense, voice of the verb, and substitutions of pronoun for noun, etc. Questions may be put in such a way as to force the pupil to employ the desired grammatical form. The second type will consist largely of rapid questions and answers upon the day's reading. In the earlier stages the questions and answers would closely follow the printed text, later the text might be used merely as a starting point for conversational practice, the pupils drawing their answers from their general knowledge of the spoken language. From time to time the class would be encouraged to relate the contents of a part or the whole of the material thus intensively studied. Success, however, in the later stages depends upon the thoroughness with which the so-called question and answer work is done. In any high school course simple questioning on a suitable connected text should occupy the major portion of the time in oral practice. It is only in this way that fluency and the requisite accuracy are assured.

Grammar. — Whatever other value the study of grammar may have in the mental training of the pupil, its immediate value is to enable him to acquire the foreign language on the form side systematically and intelligently. Only essential forms and usages should be selected, and these should be taught by constant practice rather than by drill upon rules. Correct habits of use should be regarded as of more importance than the mere learning of paradigms. In general, the treatment of grammar should be at least inductive in spirit. Traditional grammar teaching regards the translation of a number of detached sentences from and into the mother tongue as the chief exercise for clinching the previously studied formal rules. More recent teaching, however, lays great stress upon exercises planned to give a great deal of oral and written practice carried on in the foreign language itself. Some of these exercises have been suggested under the preceding topic, such as changes of tense, number, and person, etc., based upon disconnected sentences or connected reading material. The filling out of appropriate endings and a large variety of exercises all serve to give more copious and quicker drill than the older translation method. Of greater importance than these, however, are the more or less formal question and answer drills, in which the teacher's questions force the pupil to employ the new grammatical principle or form. Many of these questions will be type questions, that is, one question will admit of a comparatively large number of answers, each one of which, however, will contain the required principle or form. The judicious employment of this so-called living grammar teaching is of great advantage in giving quick, definite, and withal interesting drills which to a large extent are wanting under the still widely prevailing plan of translating detached sentences into the foreign tongue.

In a course lasting four years it seems highly desirable, in German at least, to have the first grammatical course extend over two years. The last two years might then be spent in giving richer practice and somewhat broader treatment. This plan, however, is not practiced in the majority of schools, with the result that pupils in the higher classes are often weak both in knowledge of forms and in the ability to use them accurately for the expression of simple thoughts in the foreign language.

Written Work. — Work in writing should accompany at every step the oral work in the German classroom. As a rule, it should follow directly the oral development of, and drill upon, the grammatical topic. After the material has been first threshed out orally in the classroom, it should then be put into writing, for the time being the final form. As everything cannot be written, the work should represent that which is typical and essential in the lesson or series of lessons. The results obtained from writing are fairly obvious. Hand and eye serve to fix the oral impressions, and it checks up the work on a given topic. Further, it makes for greater definiteness and flexibility in the work done outside of class. In the early stages, however, it is better to have much of the written work done in class, and thus controlled and corrected at every step. But wherever done it is a wise procedure to ask of pupils that they shall employ in their written exercises only the materials, vocabulary and principles, with which they are quite familiar through previous study.

Work in writing may be of two kinds: (1) exercises largely imitative in character, (2) exercises in translation, involving comparison between the mother and the foreign tongue. The latter type is still largely employed in all stages of the course. Latterly, however, teachers have found that written exercises; similar to, and in fact growing out of, the conversational practice, are productive of better results. In addition to the more formal exercises which emphasize a certain grammatical fact, the simple narrative of the day's lesson, and the introduction in the upper classes of the letter form of composition, offer a rich field for development. Over against this rather modern procedure, we find a large proportion of teachers still faithful to exercises in translating from the mother into the foreign tongue. In the early stages the exercises consist of detached sentences arranged under the appropriate grammatical headlines in the textbook. Later, a graded composition book, containing various styles of writing, is employed. As this kind of work prevails, often to the exclusion or at least only fitful use of free reproduction and other nontranslation kinds of exercises, it is well to point out some of the weaknesses of the practice. (1) Pupils are made to learn the foreign language by comparison before they have sufficient knowledge of its vocabulary and principles. (2) The composition books are far too ambitious in character. The acquisition of speed and accuracy should be regarded more highly than the ability to translate difficult material inadequately. Written work of all kinds ought largely to consist of material that the pupil can readily do at sight.

Reading. — Since reading is the chief aim of the modern language course, great care should be exercised not only in the selection, but also in the treatment of the material. It should be interesting, possess literary merit, and be well graded as to difficulty and the maturity of the pupils. At present, the general tendency is to read stories, and in the later years some poems and plays of classical writers. Unity and point of view are lacking in the course. It is organized only as to general amount and difficulty required for entrance to college. It would seem desirable to increase the kind of reading dealing with facts, particularly with those that give an insight into the life, customs, and history of the foreign peoples. In a four-years' German course we might, for example, group the reading material around some definite points such as these: first year, a general introduction to German life; second year, legends and sagas and the *Märchen;* third year, some few facts of history as illustrated by the lives of great personalities; fourth year, at least one literary masterpiece and brief sketches of the lives of such men as Goethe, Lessing, and Schiller.

The traditional treatment of reading is that of translation into the mother tongue. More recently systematic attempts have been made, notably in Germany, to reduce the amount of time spent upon this exercise and to increase the ability of the class to study and understand the foreign text without the aid of habitual translation. Clearness of understanding in the early stages is effected by selecting simple, objective material and teaching it by means of close questioning in the foreign tongue, by explaining new words by the use of objects, pictures, gesture, by opposites, by the study of word formation, by definition in the foreign language, or even by translating troublesome words and phrases. If the work is systematically done from the outset, translation may be limited largely to the more difficult passages, and the time usually devoted to it be employed in various exercises carried on within the language being taught. How much shall be translated is a question, however, which individual teachers will always have to decide for themselves. Length of course and the equipment of the teacher are the controlling factors. It is obvious that translation is the quickest apparent test of the pupil's understanding of a passage, although where it is used to the exclusion of all other exercises upon the text, some of its weaknesses may be summed up as follows: —

In general, translation is largely an exercise in the use of the mother tongue. As an exercise for the teaching the foreign language, it is wasteful of time as a vocabulary builder. Since the pupil exchanges symbol for symbol, it neglects almost wholly the acquisition of the form side of the foreign language, and as usually carried on, it lays but little stress upon the thought side. It has little or no influence upon the growth of language sense (*Sprachgefühl*). The foreign language is kept in the background, and is used as a mere vehicle for exercising the mother tongue.

Results of School Work. — What, briefly, should be the outcome of a four years' high school course in modern languages? The pupils should be able to read ordinary prose or poetry suitable in range of thought to their years of understanding. By far the greater proportion of the materials should be selected from modern authors. While there can be no objection to the appreciative study by the pupils of one or two of the classic dramas or other forms of literature, the reading of the classics in general should be deferred to the college period of modern language instruction. By the selection of reading material and by all other means that the teacher can devise, the pupils should be taught some elementary facts regarding the life and customs of the foreign peoples. They should have obtained by careful teaching an accurate working knowledge of the essentials of grammar in order that their growth in knowledge of the language shall always be upon a solid foundation. In addition, the pupils should have acquired the power to use a small stock of common words in speaking or in writing. They ought, for example, to be able to answer questions based upon an easy story read to them, or to give its contents in simple language either orally or in writing. Finally, they ought to have some facility in conversing about simple matters of daily life, and be able to express their doings in letter form. E. W. B-C.

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MODERN SCHOOL (*Escuela Moderna*).— The term given to the school established by Francisco Ferrer (*q.v.*) at Barcelona and imitated now in urban centers in many countries by groups holding radical social views. These schools are generally projected by the so-called philosophical anarchists, and are extremely rationalistic toward religious ideas and influences.

The *Escuela Moderna* of Barcelona is summed up by its motto: "Scientific and rationalist teaching." This does not mean that rationalist schools in Spain started with Ferrer or that the principles enshrined in the *Escuela Moderna* originated at Barcelona. As a matter of fact, Ferrer only gave fresh vitality and a more distinctly scientific rationalist tone to a more or less non-religious movement in popular education that seems to have been racy of the soil of Spain for several decades prior to the founding, in 1901, of Ferrer's *Escuela Moderna.* (Cf. Heaford's *L'École Moderne,* ed. 2, *passim,* and Archer's *Life,* etc., p. 31.) This early movement has an interesting and hitherto unknown history. On the fall of Isabella II in 1868 from the throne of Spain, a ferment of liberal ideas stirred the Spanish mind; a craving for education seized the masses, and secular schools arose in many parts of the Peninsula. (*L'École Moderne,* pp. 11 *sq.*)

The schools grew out of the enthusiasm of the various political, industrial, and rationalist groups that sprang up throughout Spain. The schools were admittedly ill-equipped and deficient in methods, most of the teaching being undertaken by untrained enthusiasts consisting of a Bohemian set of intelligent artisans, journalists, and social outlaws of all kinds. These were mostly Freethinkers, and some — notably Clemencia Jacquinet, afterwards the first Directress of the *Escuela Moderna* — were natives of France. (For her career see *L'École Moderne,* p. 17; Archer, *Life,* p. 34 *sq.*)

In 1883 the new schools had so much grown and multiplied that a federation — for some time controlled by Bartholomeo Gabarro, an ex-priest — was founded for their protection. Long prior to Ferrer's initiative, the Spanish Freethinkers had recognized the necessity of safeguarding and spreading their ideas by means of schools run under Rationalist auspices. One such school, founded as far back as 1885 — that known as *La Verdad,* at San Feliu de Guixols — was still flourishing in connection with the *Escuela Moderna* in 1907.

When, therefore, Ferrer founded his Modern School he was not launching a new movement; he was only cultivating with improved processes a ground already plowed and sown. Nor is it true to say that the *Escuela Moderna* was the Aaron's rod that swallowed up the hitherto existing secular schools in Spain. The fact is that many of the old schools, and others formed later, were autonomous bodies existing independently of the *Escuela Moderna,* though all became more or less imbued with its principles by adoption of its educational program and textbooks.

Ferrer's Manifesto (*L'École Moderne,* p. 31) on starting the Modern School stated its object to be the progressive education of the child, without superstition (he meant, Catholicism) or mysticism (Protestantism). He specially sought to avoid the awakening of what he termed the atavistic instincts of religion, race hatred, the military temper, and the spirit of revenge.

His whole school curriculum and its auxiliary publications were inspired throughout by this ideal; and Ferrer's prevision of a new social order explains why he did not accept the pedagogic doctrine that the child's schoolbooks should be silent concerning God, religion, and similar burning questions. On the contrary, his avowed aim was to enable the child to render to himself a faithful account of the source and origin of the varied social evils that afflict humanity.

The Modern School was opened in the Calle Balén, Barcelona, on the 12th September, 1901, with twelve girls and eighteen boys. At the conclusion of the first year the scholars totaled some sixty-six in all. In June, 1905, after four years of activity, there existed forty-eight schools, of which fourteen were at Barcelona, two at Carthagena and La Union, and one in Algeciras, Cadiz, Granada, Mahon, Malaga, Saragossa, etc. In 1906 the number of schools was about fifty. Early in the same year the movement had so well succeeded that Ferrer was able to invite 1700 students of the schools affiliated to the *Escuela Moderna* to a rationalistic Good Friday banquet — a celebration which gave great offense to the Catholic party in Spain. (Archer, p. 61; cf. *L'École Moderne,* p. 30.)

When, in June, 1906, Ferrer was put under lock and key for thirteen months (see **Ferrer**), nothing could arrest the torrent of the movement in Spain for the establishment of rationalist schools. New schools arose on every hand, and fresh educational centers sprang into being. Of these, one of the most successful was the *Escuela Moderna — Humanidad Nueva* — at Valencia. Founded by Dr. Samuel Torner in July, 1906, in December, 1907, it numbered 150 scholars of both sexes. The repression in 1909 closed this school, after eight others had formed around it.

Elsewhere in Spain some fifty new schools had been founded by February, 1908. Exact statistics as to school attendance at these several foundations are not available; the particulars, however, as to ten of the schools in Barcelona indicate that these latter served a total of 1000 pupils. Moreover, it is estimated that the government closure in 1909 of the rationalist schools in different parts of the country deprived more than 10,000 children of their usual and only means of education.

The school hours at the *Escuela Moderna* were from nine in the morning to 5.30 in the afternoon. The school was open from Monday to Saturday inclusive, the Sunday being devoted to lectures on scientific subjects. Boys and girls were taught together. Ferrer speaks from experience of "the brilliant result, I may even say the triumph, of mixed teaching."

The scholars were grouped only under three sections: Infants, Elementary, and Higher Elementary. In each section the first ten minutes of the school day were devoted to hygienic inspection and gymnastic exercise. The following briefly describes the curriculum under each section: —

Infants: Exercises in observation on familiar objects and knowledge of life.
  Reading (the *Silibario*, — described and Ferrer's view thereon cited, in *L'Éc. Mod.*, pp. 32–33) and writing.
  Grammar (Span.).
  Arithmetic: its operations illustrated by the combination of objects.
  Geometry: knowledge of lines according to their nature, position, etc.
  Physical geography.
  Object lessons: based on animal, vegetable, and mineral objects, and on industrial, etc., products.
  Familiar scenes: animal life.
  Manual labor.
  Gymnastics without appliances.
  Hygiene.
Elementary Section:
  Amplification of above lessons.
  Reading, with explanation of word meanings.
  Books used: Adventures of Nono (Archer's description, p. 39), *Leon Martin* (by Malats), Estevanez's *History of Spain*, and the *First Manuscript Book*, a collection of extracts from best authors, used as an exercise in reading various kinds of script.
  Writing from dictation.
  Drawing: plain and decorative.
  Physical, agricultural and industrial geography of Europe generally and of Spain and Portugal in particular. Needlework, and carving.
Higher Elementary:
  Reading, with comments.
  Texts: Patriotism and Civilization, Malvert's *Origin of Christianity, The Second Manuscript Book*, Paraf-Javal's *Substancia Universal* (for Ferrer's view of this see *L'Ec. Mod.* p. 39), Jacquinet's *Historia Universal.* (3 vols. See Archer, pp. 49–51.)
  Writing: Composition exercises, comments on the school texts, etc. These compositions, no doubt, gave birth to the remarkable school essays cited in the *Boletin.* (*Ano* III, p. 1, *Ano* IV, pp. 1–6; cf. Archer, pp. 54–58, and *L'Éc. Mod.* p. 37).
  History: General idea of the history of peoples from the point of view of the development of civilization. (Jacquinet's three remarkable volumes of history led the way for the student.) (Now translated into Portuguese, Lisbon.)
  Shorthand: classes twice a week.

In addition, we must count to the credit of the *Escuela Moderna* the botanizing, geological, and natural history rambles in the neighborhood of Barcelona (descriptions and photographs in the *Boletines*); the visits of inspection to the factories and industrial hives of the Condal City and vicinity, in order to study the processes of production; the lectures on every branch of hygienics by Dr. Martinez Vargas: those on physical geography, mineralogy and geology, etc., by the celebrated Dr. Odón de Buen, many volumes of whose works adorn the collection of Ferrer's publications. These lectures were delivered every Sunday to the students, their parents, and the general public at the school, and were deservedly popular. No elementary private school in Europe could boast of finer courses of lectures by professors of greater national and world-wide reputation.

By means of these popularizations of scientific knowledge and of the unique series of school texts and other publications (see FERRER), the founder of the *Escuela Moderna*, at the cost of his fortune, his liberty, and ultimately of his life, provided the neglected people of Barcelona, and, radiating therefrom, some hundred or more centers in Spain, with the nearest approach to the encyclopedic curriculum of a university *en règle* that probably any democracy in Europe has had placed within its reach. The students at the Modern School were demonstrably more fortunate in educational advantages than millions of children in more fortunate countries than Spain. Ferrer would have been the first man in the world to acknowledge the imperfections of his system, but, for all that, the schools were admittedly "very well managed and very well equipped."

See FERRER. W. H.

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See also references under FERRER.

MODERN SIDE. — A term applied to that division in English secondary schools in which the chief emphasis is laid on modern subjects, — language, science, and mathematics. Of the classical languages Latin alone is studied to a small extent. The modern side is intended for the preparation of boys for business, army, and civil services. In some schools commercial subjects are also taught in this department. As a rule boys do not proceed from the modern side to the universities. In addition to the modern side, it is not unusual to have other special divisions for science and mathematics. While modern subjects have been taught since the seventeenth century here and there in English schools, no value was attached to them either by the boys or masters. Since the passing of the Endowed Schools Act, however, the modern sides have sprung up to meet the increasing demand for a type of secondary education which did not aim at preparing for the universities. The modern side may on the whole be said to correspond to the German Realschule.

See ENDOWED SCHOOLS ACT; GRAMMAR SCHOOLS; ENGLAND, EDUCATION IN, etc.

MODESTY. — This term is used to denote two quite different characteristics of the emotional life, which Darwin has pointed out have little in common except the blush as a distinguishing expressive reaction. In the first sense the term refers to that characteristic of some individuals which tends to make them hold a moderate opinion of their own worth and attainments. Used in the second sense, modesty is an attitude of mind which revolts against indelicacy of any sort, especially that involving sexual relations. From the psychological point of view, both of these forms of reaction are instinctive attitudes and accompanied by emotional feelings, and capable, like other instincts, of modification and training by the influence of environment. Development of modesty in the second sense does not properly take place until the time of puberty, though it is not always of sexual origin.

E. H. C.

See ADOLESCENCE; EMOTIONS.

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CHAMBERLAIN, A. F. *The Child*, p. 281.
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ELLIS, H. The Evolution of Modesty. *Psych. Rev.*, Vol. VI, 1899, pp. 134–135.

MOERBEKE, WILLIAM OF (*d.* 1281). — Archbishop of Corinth (1277–1281), and translator of Aristotle. He derived his name from a small town on the borders of Flanders and Brabant, whence he is also known as William of Brabant or William the Fleming (as he is called by Roger Bacon). He was chaplain to Clement IV and Gregory X, and acted as Greek secretary at the Council of Lyons (1274). He translated Aristotle's *Politics* and *Rhetoric* from the Greek, and also Hippocrates' *Prognostics*, Galen's *De Alimentis*, and Proclus' *Decem Dubitationes*, *De Providentia*, and *De Malorum Subsistentia*. The translations of Aristotle, though very literal, are of value as representing a text, now lost, better than any now extant.

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MOHAMMED IBN MUSA. — See AL-KHOWÂRAZMI.

MOHAMMEDAN EDUCATION. — See ARABIC EDUCATION; EGYPT, EDUCATION IN; INDIA, EDUCATION IN; PERSIA, EDUCATION IN; TURKEY, EDUCATION IN, etc.

MOLUCCAS, EDUCATION IN THE. — See NETHERLANDS, COLONIES OF, EDUCATION IN THE.

MONASTICISM AND EDUCATION. — The vast subject of the relation of monasticism to education is treated from so many angles in various articles of this Cyclopedia that a special treatment is superfluous. Under this caption the only attempt will be to relate organically these scattered accounts. The fundamental problem, about which there is much controversy as to whether the more important and general educational activities during the Middle Ages were carried on by monastic bodies or by the secular organization of the church, is discussed under the titles ABBEY SCHOOLS and CLOISTER SCHOOLS, these being the general terms used for monastic schools in England and Germany, respectively. The general conclusions of these discussions, contrary to the commonly accepted views, is in favor of the regular church hierarchy, and adverse to the claims of the monastic organization. A similar view is expressed in the general article on EDUCATION DURING THE MIDDLE AGES. Here the relation of the monastic organization and theory to the general intellectual and educational conditions is discussed. On the other hand, the actual educational work of the leading monastic organizations is presented in the separate articles on the leading monastic bodies, such as the BENEDICTINES, FRANCISCANS, DOMINICANS, CISTERCIANS, and others. The relation of these bodies to the education of women and girls both during the Middle Ages and the modern period is presented in the articles on CONVENT SCHOOLS and in the historical section of the article on HIGHER EDUCATION OF WOMEN. The educational work of the post-Reformation period, and of the monastic orders having education as one of their chief functions, is presented in the articles on the JESUIT SYSTEM OF EDUCATION, the PORT ROYALISTS, the ORATORIANS, the PIARISTS, and the TEACHING ORDERS OF THE ROMAN CATHOLIC CHURCH. The philosophical aspects of monasticism are considered under MYSTICISM, NEO-PLATONISM, and related topics, SCHOLASTICISM AND SCHOOLMEN. For noted monastic educators, see the articles on the special orders. For the bibliography of the subject, see the reference lists in connection with the articles mentioned above.

MONGE, GASPARD, COMTE DE PELUSE. — Was born at Beaune, May 10, 1746, and died at Paris, July 28, 1818. He was one of the leading mathematicians of his time, and is known for his work in descriptive geometry. In the history of education he is worthy of recognition as being one of those most active in promoting the École Polytechnique. He first taught his descriptive geometry in one of the military schools (1768) as a secret of the service. He later taught it in the École Normale at Paris (1794), and still later in the École Polytechnique. Politically his life was one of turmoil. Although an ardent revolutionist, he barely escaped the guillotine. He was in great favor with Napoleon, but on the restoration he was deprived of all his honors and offices, and died soon after as a result of his disgrace.
D. E. S.

MONEYS, SCHOOL. — See Apportionment of Funds; School Funds.

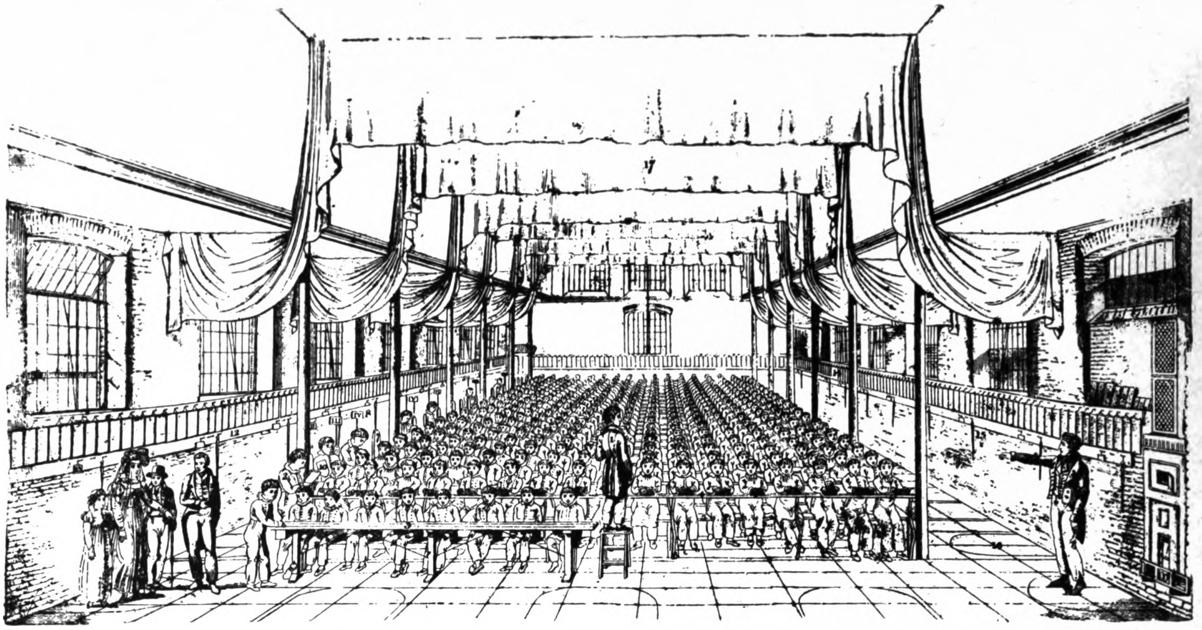
MONISM. — The name for the philosophical theory which holds that there is but one ultimate substance or reality. The term is quite formal in character, connoting nothing about the nature of the one ultimate being. Thoroughgoing materialism, absolute idealism, panpsychism, pantheism, are alike monistic. The vagueness of the term is enhanced by the fact that the motif of some monistic systems is opposition to dualism, while that of others is opposition to pluralism. Consequently, some contemporary theories are monistic in their denial of dualism (*q.v.*), especially as relates to any final cleavage between mind and matter, and yet are pluralistic in holding that the various forms in which the one ultimate reality occurs do not form an interdependent necessary whole, but are relatively independent of one another, or form real individuals.
J. D.

MONITORIAL SYSTEM. — In one of the *Arabian Nights* a scamp who could neither read nor write opens school and conceals his ignorance by setting the children that knew a little to teach those that knew less. His plan has often been tried since. It is prescribed by the ordinances of a sixteenth-century grammar school; a Portuguese traveler saw it in India in 1623; Comenius (*q.v.*) suggests it in the *Great Didactic;* Mme. de Maintenon (*q.v.*) introduced it at Saint-Cyr; Rollin (*q.v.*) mentions it as a useful expedient; Herbault applied it in the Paris Hospice de la Pitié in 1747 and the Chevelier Paulet in an orphan school at Vincennes in 1772; and the Abbé Gaultier, a refugee from the Revolution, practiced it in the capital of the only country where it was ever employed on a large scale.

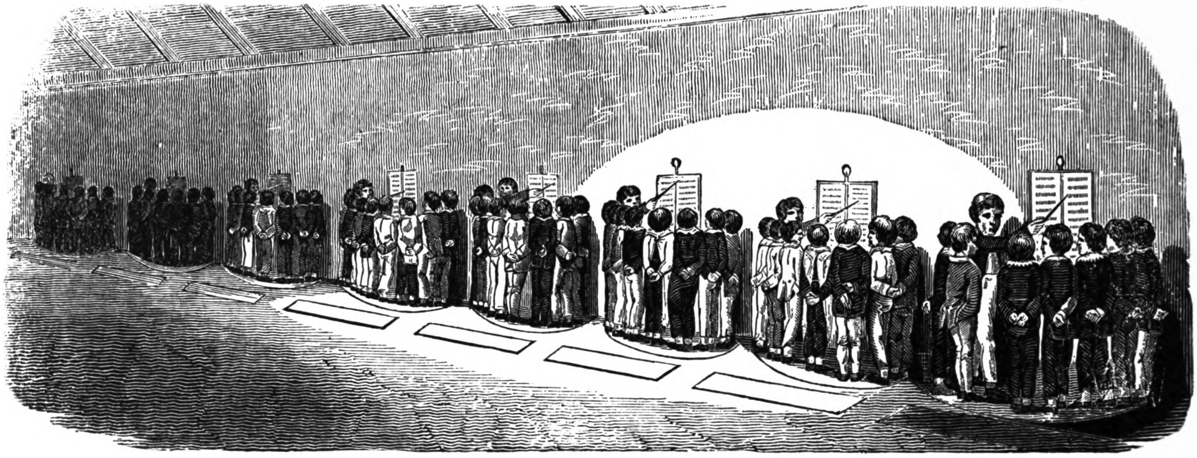
Its spread in the United Kingdom was facilitated by a combination of causes. Long and acrimonious disputes in the press, on the platform, and even from the pulpit as to the rival claims of Bell (*q.v.*) and Lancaster (*q.v.*) to the honor of inventing it, made it generally known; its cheapness rendered the establishment of schools possible just when the public conscience was awakening to the need of them; and two great educational societies (see British and Foreign School Society and National Society) were founded to establish schools in which it could be applied to teaching children to read the Bible or the Church Catechism.

Bell was led (in 1791 or 1792) to employ monitors because the masters of a school at Madras of which he was superintendent offered a passive resistance to his efforts to introduce the native method of teaching the alphabet by writing on sand. In 1797, after his return to England, he published an account of his *Experiment*, but the book attracted no attention, and the author, who had settled down in a snug rectory, allowed it to be forgotten till Lancaster began to excite public interest. Lancaster began (about 1801) to employ monitors because his school had grown too large for him to teach alone and he could not afford to pay for help. There is no doubt that the idea occurred to him independently, but before he had worked it out in all its details he came across a copy of the *Experiment.* He closes the account of his *Improvements* (published in 1803) with an acknowledgment that he had "adopted several useful hints" from the *Experiment*, and with an expression of regret that he was not "acquainted with the beauty of" Bell's plan "till somewhat advanced in" his own.

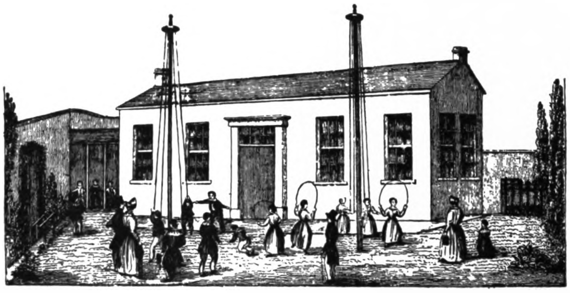
That Lancaster could be accused (with that appearance of truth which even a false accusation requires) of counterfeiting Bell shows that there must have been a considerable resemblance between the two systems. An account of the differences between them would occupy more space than the importance of the subject warrants, but it may be stated generally that Lancaster's was far more elaborate than Bell's. Bell held that for a class "the best number" was "from twenty-four to thirty or in large schools to forty"; Lancaster thought ten the ideal number for a "draft." For teaching alone therefore he required far more monitors, and he employed them for many other purposes. "When a child was admitted, a monitor assigned him his class, . . . when he was absent one monitor ascertained the fact and another found out the reason; a monitor examined him periodically and when he made progress a monitor promoted him; a monitor ruled the writing paper; a monitor made or mended the pens; a monitor had charge of the slates and books; and a monitor-general looked after all the other monitors." Bell expected his masters to exercise initiative and



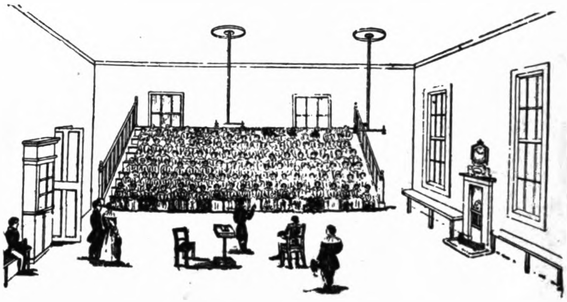
Interior of the Central School of the British and Foreign School Society, London.



A Monitorial School in Operation; from a Manual of the British and Foreign School Society.



The Outdoor School of the Stow Monitorial System.



The Covered School of the Stow System.

Monitorial Schools.

judgment; Lancaster expected his to do little more than watch and admire the "system" working almost automatically. Beyond the adoption of sand-writing Bell made hardly any change in the old methods of instruction; Lancaster, who (with proper acknowledgment) copied the sand writing, used wall sheets instead of books for reading, and slates instead of paper for writing, invented dictation, and a method (now happily forgotten) of teaching arithmetic. Bell's rewards and punishments were few and simple; Lancaster's rewards in practice and punishments on paper were many and curious.

The fact that the monitorial system, so often abandoned elsewhere after a brief trial in one or two institutions, should have flourished throughout the British Islands for some forty years may be attributed to its cheapness and its (comparative) effectiveness. (1) The initial cost was small, as neither Bell nor Lancaster required more than a bare room, which was often found ready to hand; and neither required much furniture, the pupils standing at most of the lessons. The cost of maintenance was greatly reduced by dispensing with assistants; Lancaster boasted that in his schools it did not exceed "seven shillings each child for twelve months, and probably may be reduced by the perseverance of the inventor under unmerited opposition to four." In days when the establishment and maintenance of schools depended entirely on enlightened benevolence, Bell and Lancaster made their establishment and maintenance possible.

(2) In the old schools the method of teaching was individual; hence the children, except during the few minutes that they were "saying their lessons" to the master or mistress, were generally wasting their time. In a monitorial school, divided into classes, with an abundance of teachers of a sort, there was no idling. One of Lancaster's maxims was "Let every child at every moment have something to do and a motive for doing it," and Bell would not have disclaimed it, if any one else had uttered it. Another cause of comparative effectiveness was that, while none of the old teachers had been made and few of them had been born, Lancaster's and Bell's teachers had all been trained, after a fashion. Nobody may have seen the necessity for teachers to be taught the principles of education, but everybody could see the necessity of studying a new machine before being placed in charge of it. Lancaster began training apprentices in 1805, and adults were admitted to "learn the system" from 1809 in the Central School of the British and Foreign School Society in the Borough Road (*q.v.*) and from 1812 in the Central School of the National Society in Baldwin's Gardens. Thus, though the best monitorial school may have been poorer than most of its successors, the poorest must have been better than most of its predecessors.

The inherent defects of the monitorial system are too obvious to need pointing out, but there was an economic consideration which told as potently as the educational considerations against permanence. The monitors were necessarily the brightest and most forward children, and parents who sent them to school to learn would be unwilling that they should remain to teach. The managers tried to overcome the parental unwillingness by paying the monitors a few pence a week, but the inducement was inadequate when a few shillings a week might be earned elsewhere. One consequence was the employment of a smaller number; another was the modification of the system. In 1839 the committee of the British and Foreign School Society reported that they were "by no means disposed to bind themselves exclusively" to it, and in 1841 they reported that "the British System as now practised in the Central School may properly be denominated mixed, simultaneous teaching being satisfactorily united with that which is monitorial." The mutation might have gone on indefinitely, if the system had not suffered transmutation. After the issue of the famous Minutes of 1846, the monitor receiving a few pence a week from the managers became a pupil teacher apprenticed for five years, receiving a fair wage from the government with the promise of a subsequent Queen's scholarship tenable for two or three years in a training college. Thus the monitorial system, besides giving England cheap schools which afterwards became good schools, led ultimately to her having a body of efficient teachers.

Spread of the System. — Lancaster's English supporters saw in his plan not an end, but an instrument, — an instrument for teaching the children of the poor to read the Bible. That their purpose was not limited to their own country is indicated by the title which they deliberately adopted, — the British and Foreign School Society. The society had no paid agents abroad, but William Allen (*q.v.*) and other members acted as its voluntary agents in the course of their travels. It did not directly establish any schools outside the United Kingdom, but it was always ready to give information; it sometimes furnished teachers; and it often made grants of books and material.

France. — France was the only foreign country in which the monitorial system was ever widely diffused. The first steps toward its introduction were taken by the Society for the Encouragement of National Industry. Having during the war heard vague reports of the extraordinary success of the system, the society, when the treaty of 1814 made peaceful intercourse possible, sent over four of its members to investigate — the Comte de Laborde, the Comte de Lasteyrie, François-Edmé Jomard, and Jean-Baptiste Say. They were present at the half yearly meeting of the British and Foreign School Society in November, and visited the Central School in the Borough Road, the Central School of the National Society in Baldwin's Gardens, and several other schools in various parts of the country. On their return Laborde and Lasteyrie wrote books on the system, and Jomard wrote a long report on it for the society; Say only describes its " admirable effects " in the book which he wrote.

The deputation having returned to Paris, the society which had sent them met on Mar. 1, 1815, and resolved to form an independent association (the Society for Elementary Instruction). Napoleon landed on this very day, but the change of government did not impede the movement. On Apr. 27, Carnot, the new Minister of the Interior, presented a report to the Emperor, which was followed by a decree ordaining the minister to make inquiries as to the best methods of education and to establish an experimental school in Paris. This school was opened in an "apartment" in the Rue Saint-Jean-de-Beauvais on June 13, the master being the Rev. Francis Martin, of Bordeaux, trained in the Borough Road. Although he was a Protestant, his employment was rendered possible by the liberal rule of the society: "All possible care shall be taken that the first principles of religion shall be inculcated, the developments of which shall be left to the ministers of religion." A minority of the committee considered that this did not involve the reading of the Scriptures, but the president, the Baron de Gérando, wrote to Martin on Aug. 24, entreating him not to delay putting into the hands of his scholars the Bible of Royaumont, which was not a Bible at all, but a collection of scriptural pictures with explanations.

The government of the restored monarchy did not at first manifest any hostility. On Nov. 3, 1815, the Prefect of the Seine, the Comte Chabrol de Volvic, appointed a board of primary instruction for the prefecture, and on Feb. 29, 1816, a royal decree was issued granting fifty thousand francs a year to the Society for Primary Instruction, and appointing a primary education committee for every canton. Except for the grant, the decree was little more than a pious wish, as it provided no means for compelling the committees to act and no money for them if they did act; still it must have had some effect, for fifteen hundred monitorial schools were opened before 1820.

A heated polemic began in 1816. As in England Tories supported Bell and Whigs Lancaster, in France the clerical reactionaries advocated the simultaneous method employed in the schools of the Christian Brothers (*q.v.*) and the Liberals the method which, to avoid a foreign name, they called mutual. The reactionaries had sufficient influence to obtain a decree that all Protestant teachers should be dismissed, that the Roman Catholic religion should be taught in all schools, and that the Christian Brothers should have a monopoly wherever they chose to exercise it. Though the reactionaries failed in their effort to suppress the royal grant, they were on the whole successful; only six hundred monitorial schools remained open in 1828, and these continued only till the inherent difficulties of the system became manifest. The Society for Elementary Instruction is still in existence.

Russia. — Alexander I was a religious and benevolent despot. He was considerably influenced by some Quakers settled in St. Petersburg. It was probably from them that he heard of monitorial schools, and in 1813 he commissioned Joseph Hamel to report on them. On his own visit to England after the peace of 1814 his interest was deepened. He sent four youths to the Borough Road to " learn the system," and ordered its introduction into the military schools. Some of the nobles, from flattery or conviction, established schools on their estates. A few of these long survived the Czar.

Norway and Sweden. — Accounts of the monitorial system were published in Sweden by the Count Jacob de la Gardie, who lived in London, by Mr. Svensson, who was sent over by the King, and by J. A. Gerelius, one of the King's secretaries. These three were the leading spirits of a society established in 1822 to promote the establishment of schools. Some years later Parliament voted funds for the establishment of a normal school. In 1841 there were nearly five hundred schools on the plan, but the law of 1842 making education a national concern caused cheapness to be no longer the chief consideration, and monitors gradually disappeared.

Denmark. — The prime mover in Denmark was the Chevalier d'Abrahamson, who wrote a book on the system and in 1819 established at his own cost the first model school. Encouraged by the King and Queen, the new plan made rapid progress; by 1831 it was used in nearly 3000 schools, and a knowledge of it was one of the essentials of the teacher's diploma.

United States. — Monitorial methods of instruction were introduced into the United States through the Lancasterian System as first embodied in the work of the Public School Society of New York City from about 1809. This system spread very rapidly throughout the country, especially in urban communities, and its popularity and cheapness did much to further the interest in popular education. Monitorial methods were not limited to elementary schools, but academies, indeed whole state systems of academies as in New York and Indiana, were organized, at least ostensibly on the basis of these methods. The Lancasterian plan had lost its vogue by 1840, but monitorial methods both in organization and in teaching were popular and widely used for more than a generation later. They have survived into the more recent generation however only in a very subordinate rôle in schoolroom management. The extent of the influence of the monitorial system is treated somewhat indirectly in the articles on New York City School System, Public School Societies, and on Joseph Lancaster.

Other Countries. — In European countries (such as Germany and Holland) which had a good system of education the monitorial system had no acceptance; in backward countries (like Italy and Spain) its acceptance was sporadic. Missionaries used it in the West Indies, and under the direction of James Thomson, an agent of the British and Foreign Bible Society, it achieved a remarkable success in South America. D. S–n.

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MONITORS. — See Monitorial System; Prefect and Prefectural System.

MONMOUTH COLLEGE, MONMOUTH, ILL. — A coeducational institution opened as an academy in 1853 and chartered as a college in 1857 under the control of the United Presbyterian Church of North America. Preparatory, collegiate, and musical departments are maintained. The entrance requirements are fifteen units. The degrees of A.B. and B.S. are conferred. The enrollment in 1910–1911 was 451 in all departments.

MONOMANIA. — See Abnormality.

MONROE, LEWIS BAXTER (1825–1879). — Author of a series of school books and professor of elocution. He was educated in the common schools of Massachusetts and at the Castleton (Vt.) Academy. He taught in the public schools of Massachusetts and New Hampshire, organized a school of elocution and oratory in Boston, and was professor of elocution in Boston University. He published a series of school readers and spellers and numerous works on elocution. W. S. M.

MONTAIGNE, MICHEL EYQUEM DE (1533–1592). — French essayist, moralist, educational theorist, and man of affairs. A student of law, courtier, councillor in the Bordeaux parliament, and twice mayor of Bordeaux, his claim to renown rests upon his essays. Although his ideas upon education are found scattered through many of his essays, the particular one entitled *Concerning the Education of Children* contains his chief contribution in the field of educational theory. While Montaigne has points in common with Rabelais, Bacon, Comenius, and Rousseau, it is by no means easy to classify him as an educational theorist. Dr. Monroe's expression "social-realist" is probably the most satisfactory to apply to him. His appreciation of the significance of the educational problem is expressed in his own words: "The greatest difficulty with human learning seems to be in the field where it treats the care and instruction of children." One of his most pregnant and oft-quoted comments on education is the following: "To know by heart is not to know at all; it is merely to retain what one has entrusted to his memory." He is seeking rather training of the judgment than mere "bookish education," as he characterizes it. The first edition of the *Essays* appeared in 1580. Of the modern editions that of Courbet et Roger (Paris, 1872–1900) is probably the best. F. E. F.

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MONTANA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS, BOZEMAN, MONT. — An institution established in 1893, in pursuance of the Morrill Acts, by the legislature of Montana. College courses leading to degrees are offered in divisions of agriculture, engineering, and science, which includes home science. In addition, there are courses not leading to degrees in the schools of agriculture, pharmacy, art, music, preparatory, and other special courses. An experimental station is also maintained. The entrance requirements to the college courses are fifteen units. The enrollment in 1911–1912 was 595. The faculty numbers forty-four members.

MONTANA, STATE OF. — First organized as a territory in 1864, and admitted to the Union in 1889 as the forty-first state. It is located in the Western Mountain Division, and has a land area of 146,201 square miles. In size it is about three times as large as the state of New York, larger than Prussia, and nearly as large as California. For administrative purposes the state is divided into twenty-eight counties, and these in turn into school districts. In 1910 Montana had a total population of 376,053, and a density of population of 2.6 per square mile.

Educational History. — The first school report was made in 1868, though never printed. This showed a total of 2000 children, 25 school districts, 15 schoolhouses, and 27 teachers in the territory. The series of printed annual reports begins with 1879, at which time the school system had grown to 130 districts, 119 schoolhouses, and 161 teachers. The revised school law of 1879 contained the essential outlines of that in use at present. One provision of the law required separate schools for negroes, though there must have been very few in the territory at the time. In 1881 the first uniform textbook law was enacted, providing for a uniform series of textbooks, to be adopted for four-year periods. In 1882 the Territorial Teachers' Association held its first meeting. In 1883 a permissive town and city library law, with a permissive library tax, and the first compulsory education law, were enacted. In 1885, at the time of the new textbook adoptions, a Territorial Textbook Commission was created. In 1886 Congress passed the temperance physiology bill, making such instruction mandatory in all the territories. In 1889 a uniform course of study for all of the schools of the territory was first issued.

In February, 1889, the enabling act was passed by Congress, a constitution was adopted in August, and the territory was admitted as a state in November of that year. At this time there were 344 school districts, 419 schoolhouses, and 507 teachers in the new state. The new constitution made definite provision for "a general, uniform, and thorough system of free schools" for the state; provided for the election of a State Superintendent of Public Instruction, for four-year terms, and county superintendents of schools for two-year terms; made women eligible for any district or county school office; defined the public school fund, provided for additions to it, and for the apportionment of the net income on the census basis; authorized taxation for education; prohibited local and special laws for schools, any aid to sectarian or private schools, religious or partisan tests or instruction, and any discrimination at the university on the basis of sex; created a State Board of Education, to which was given the control of all of the state higher and special institutions, and a State Board of Land Commissioners to look after, lease, and sell the school and other educational lands; exempted school and library property from taxation, limited school district indebtedness to 3 per cent, and provided that district school elections must be held at a different time from state and county elections. The Code Commission, in 1891, proposed a new school law for the state.

In 1893 the State Board of Education, provided for in the constitution, was created by law, and the establishment of the State University at Missoula, the State Agricultural and Mechanical College at Bozeman, the State School of Mines at Butte, and the State Normal School at Dillon, were authorized. In 1895 a recodification and revision of the school law was adopted by the legislature, to which only minor amendments have since been made. The law of 1895 does not differ greatly from the old law of 1879. A school library law was also enacted. In 1897 the state textbook law was revised to provide for six-year adoptions, and optional free textbooks for any districts voting to provide them. In 1899 the free county high school law was enacted. In 1903 the old compulsory education law, which had remained almost a dead letter for twenty years, was revised and strengthened, the education of poor children was provided for, and industrial schools, for the better enforcement of the law, were authorized. In 1909 the State Board of Education was given somewhat larger authority in the management of the state institutions, and instruction as to dangerous and communicable diseases was required in the schools. In 1911 graduates of the University of Montana, when recommended by the university, were to receive five-year high school teachers' certificates, exchangeable after twenty-seven months of teaching in the state for life diplomas. An Educational Commission to revise and codify the school laws was created in 1911; and a bill requiring elementary manual training in all grades, manual training in the upper grammar grades in all large towns, and direct vocational training in the cities, with state aid of $10 per year per pupil attending such courses, was adopted.

Present School System. — At the head of the present school system of Montana is a State Board of Education and a State Superintendent of Public Instruction. The State Board of Education consists of the Governor, State Superintendent, and Attorney-General, *ex officio*, and eight others appointed by the Governor with the concurrence of the Senate. They are appointed for four-year terms, two being appointed each year. This board possesses rather unusual powers in that it has supervisory control and acts as a Board of Regents for all of the higher and special state institutions (university; agricultural and mechanical college; school of mines; state normal schools; orphans' home; reform school; and state school for the deaf, blind, and feeble-minded), as well as acting as a State Board of Education in the usual sense for the schools of the state. Acting as a board of control for the higher and special institutions, it appoints the president and faculty of each; grants all degrees and diplomas, as recommended by the different faculties; controls the land funds, and the general expenses of each; adopts rules and regulations for their government, and appoints an executive committee of three to manage each institution, and to report back to the board. Acting as a State Board of Education it adopts rules and regulations, not inconsistent with law, for the administration of the schools of the state; grants state certificates and life diplomas to teachers; appoints and commissions experienced teachers to act as institute conductors; and may accredit other institutions (colleges and normal schools) within or without the state. A State Board of Land Commissioners, consisting of the Governor, State Superintendent, Secretary of State, and Attorney-General, has control of the leasing and sale of the university, school, and other educational lands of the state, and the investment of the accumulated funds. A State Textbook Commission, consisting of seven persons appointed by the Governor for five-year periods, five of whom must be experienced educators, adopts a series of uniform textbooks for the schools of the state, for five-year periods, and contracts with the publishers for the same.

The State Superintendent of Public Instruction is elected by the people for four-year terms. He must hold the highest grade of Montana state teachers' certificate, or be a graduate of a university, college, or normal school. He is paid a salary of $3000. Except as specified for the State Board of Education, he has general supervision of all of the schools of the state; preserves all records, and furnishes all blanks; keeps a record of all of his official acts; prepares lists of books suitable for school libraries, and prescribes rules and regulations for their government; prepares all questions for the examinations for teachers' certificates, makes rules and regulations for the management of the same, and for cause may revoke state or life diplomas; prepares and publishes a course of study for the schools of the state; issues rules and regulations for the holding of teachers' institutes, and visits the same; advises county superintendents, hears and decides appeals, and makes rules and regulations governing appeal cases; apportions the school fund to the counties; and makes a biennial report to the Governor.

For each county there is a county superintendent of schools, elected by the people for two-year terms. Women are eligible for this office, and nearly all of the positions are held by them. Each county superintendent has general supervision of the schools of the county, under the direction of the State Superintendent; must visit each school at least once a year, and advise with teachers and trustees; decides district controversies; administers oaths to all subordinate officials; apportions the school money to the districts; selects institute instructors, from a list submitted by the State Board of Education; presides at the county institutes; may issue temporary teachers' certificates, on evidence of fitness; keeps a record of all district boundaries, and may adjust them; acts as one of a board of trustees for any county high school established; makes an annual report to the State Superintendent; and acts as a member of the county board of examiners. The other two members of this board are appointed by the county commissioners, and must hold high-grade teachers' certificates, or be graduates of a normal school or college. The board conducts all examinations within the county for teachers' certificates, and all examinations for graduation from the eighth grade.

Each county is divided into a number of school districts, for each of which a board of school trustees is elected. Three classes of districts exist, according to population, with from three trustees in all districts having less than 1000 to seven in cities of over 8000. The school election takes place at the schoolhouse the first Saturday in April, and women may vote and are eligible for the office. Vacancies are filled by the county superintendent, by appointment. New districts may be formed when ten or more children are over two miles from a schoolhouse. Each board must follow the instructions of the State Superintendent; see that the schools are taught in the English language; employ teachers for the schools; repair, insure, and care for the schoolhouse; may suspend, expel, or exclude undesirable children; must supply books to indigents, and, on vote of the district, must supply free textbooks; may add additional branches of instruction, may establish kindergartens and a high school, and may grade the school into departments; and must make an annual report to the county superintendent. If their funds exceed $25,000, they must print a financial report, and if a less sum, the clerk must make a financial statement annually. If deemed best, trustees may close a school and transport the children to another school, paying tuition for them. An annual school census must be taken by the clerk of each district. From 5 to 10 per cent of the county school fund must be spent each year for school libraries, which are to be kept in the schoolhouse, and their condition reported annually to the county superintendent. Cities of 4000 population may employ a city superintendent, for four-year terms.

School Support. — Montana received 5,112,035 acres of land from the sixteenth and thirty-sixth section grants. As late as 1908 some 2,000,000 acres were as yet unsurveyed, and about 1,500,000 acres were under lease. The permanent fund at present amounts to about $6,000,000. A number of miscellaneous sources of income are specified to be added to the fund. The income from this fund is apportioned to the counties on the basis of the school census. The County Commissioners of each county must levy a four-mill county tax, which, with the net proceeds of fines, is added to the state school money and apportioned to the different districts on census also. Any district board may levy up to ten mills for maintenance, and in first and second class districts (over 1000 population) up to an amount sufficient to maintain a nine months' school. After an eight months' school has been maintained, if the district so votes, surplus funds may be used for building purposes. County high schools may levy a county tax up to three mills for maintenance, and up to ten mills, if erecting a building. The county treasurer is the custodian of all funds for all kinds of districts, paying out the funds only on orders from the district school authorities.

In addition to common school lands, the state also received two townships of land (46,080 acres) for a state university, and 90,000 acres for an agricultural college. At the time of its admission as a state Montana also received further special grants of 50,000 acres for the agricultural college, 100,000 acres for the school of mines, 100,000 acres for the normal school, 50,000 acres for the reform school, and 50,000 acres for the school for the deaf and dumb.

Educational Conditions. — Considering the sparse population, educational conditions in the state are very good. The population is about 70 per cent native, 95.9 per cent white, and less than 1 per cent negro. The remainder is Oriental, mostly Chinese. The schools are well supported, and the per capita expenditure is very high. About 30 per cent of the districts supply free textbooks. The school libraries average over 100 volumes to the building. The schoolhouses are good, averaging about $3500 in value. More than one half of the counties have established county high schools, and a number of district high schools are maintained. So much have the high schools developed within recent years that the university has been able to dispense with its preparatory department. There are as yet only about 1000 school districts in the state, and trustees often live twenty miles apart. The school term throughout the state averages nearly eight months (7.9), and nine months in the cities and towns. The state has a fairly good compulsory education law, but the machinery for enforcing it is weak. Teachers in private and parochial schools must coöperate in enforcing the law, and private schools must make reports to the public school authorities. No distinctions based on race or color are allowed.

Teachers and Training. — The state employed 2250 teachers in 1910, of whom 12 per cent were men, 11 per cent were college graduates, and 26 per cent were normal school graduates. The salaries paid were fairly good, averaging about $900 for men and $600 for women. For the training of teachers the state maintains a good state normal school at Dillon, and graduates of the university may also be certificated, if they have taken the required work in education. The state is very liberal in the matter of accrediting normal schools and colleges in other states, as well as the state certificates and diplomas possessed by new teachers coming to the state. This has enabled the state to attract to it many well-trained Eastern teachers. A county teachers' institute of from three to ten days is held each year, and all teachers except high school teachers are required to attend. They receive full pay while attending. The amount to be expended for the institute varies, in different counties, from $100 to $300.

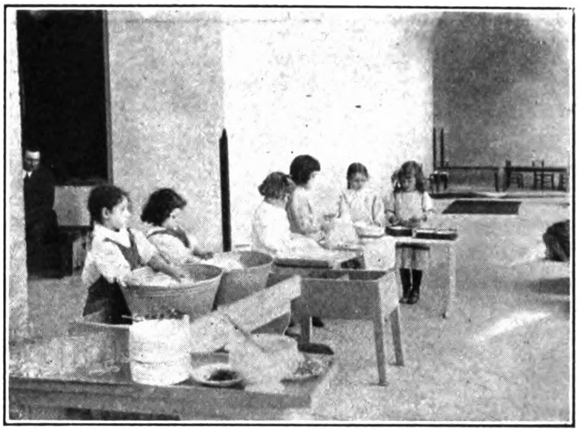
Four grades of teachers' certificates are issued on county examinations, based on questions prepared by the State Superintendent. The examinations form a good graded series, and in granting certificates the county superintendent and the examiners are authorized to take into consideration the candidate's teaching experience and success, as well as aptness, knowledge, and personal character. High school teachers and principals of schools of three or more teachers must hold the highest grade of county certificate or a state certificate, or be graduates of a university, college, or normal school. The two highest grades of certificates are valid in any county. Normal school and university graduates may be certified without examination. State diplomas and life diplomas are granted by the State Board of Education, and these involve still further advanced examinations.

Higher and Special Education. — The University of Montana, at Missoula, opened in 1895; the Montana College of Agriculture and Mechanical Arts, at Bozeman, opened in 1893; and the Montana State School of Mines, at Butte, opened in 1900, stand as the culmination of the public school system of the state. The state also maintains a number of experimental substations in horticulture and agriculture. The Montana Wesleyan University, at Helena (M.E.) organized in 1888 and opened in 1890, and the College of Montana (Presby.), at Deer Lodge, organized in 1878, are the only other institutions of collegiate rank in the state.

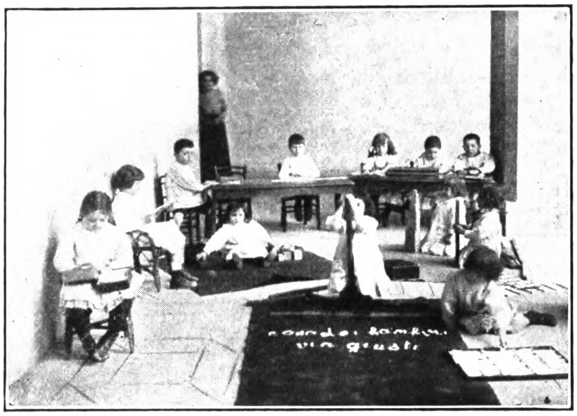
The state also maintains the State Orphans' Home, at Twin Bridges (a state home and public school for orphans, foundlings, and destitute children); the Montana School for the Deaf, Blind, and Feeble-Minded, at Boulder; and the Montana State Reform School, at Miles City.

E. P. C.

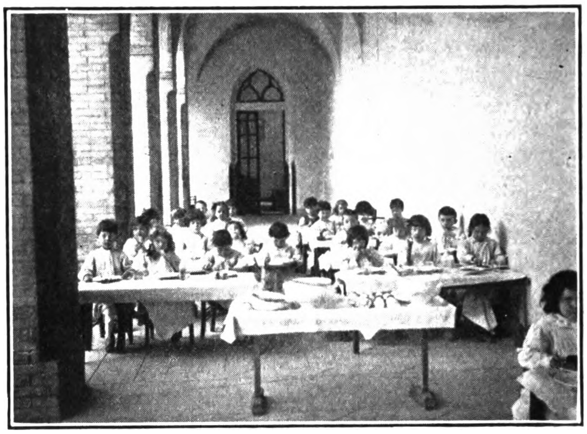
Blindfold Work with the Didactic Materials.



Washing Dishes after the Noonday Meal.



Working with the Didactic Materials.



The Midday Meal.

Paolina Grasso
4 years old
Wrote her first word one month ago

Learning to Write.

Learning to Write.

THE MONTESSORI SCHOOL.

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MONTANA STATE SCHOOL OF MINES, BUTTE, MONT. — A state institution provided for in the enabling act of 1889. It is maintained by biennial appropriations made by the legislative assembly. Fifteen units are required for admission to the courses, which are purely technical and lead to the degree of Mining Engineer. The enrollment in 1910–1911 was fifty-nine. There is a teaching staff of eight members.

MONTANA, UNIVERSITY OF, MISSOULA, MONT. — A coeducational institution founded in 1893 by legislative act and placed under the State Board of Education. The university was opened in 1895. There is a campus of forty acres, and at present there are six buildings used for instructional and other purposes. The university is maintained by the income from a university fund, annual appropriations, tuition and matriculation fees, and public and private contributions. The requirements for entrance are fifteen units, two of which may be carried over under conditions for one year. The degrees of B.A., B.S., and B.S. in Engineering with the corresponding master's degrees are conferred after the completion of the appropriate courses. The university has power to grant legally recognized certificates of qualification to teachers. The enrollment in 1910–1911 was 220 students, and the faculty consisted of twenty-seven members.

MONTESSORI METHOD, THE. — This method of teaching children of the kindergarten or early primary school age is the work of Dr. Maria Montessori of Rome. For several years prior to 1900, Dr. Montessori was assistant at the Psychiatric Clinic in the University of Rome. This position brought her in close touch with the defective children who were at that time confined in the insane asylums. Thus it was that she became a close student of the methods of Itard and Séguin. Guided by the work of these two men, she devised a large amount of didactic material and began the teaching of these unfortunates. The results were so satisfactory that these children were able to pass the examinations required of the Roman children in the elementary schools. These positive results brought her to the attention of the school authorities, and she was invited to deliver lectures before the teachers of Rome. Eventually these lectures led to the formation of an institute which continued under her direction for several years.

It was a conviction with Dr. Montessori that methods which were so effective with defectives would be correspondingly effective with normal children. The opportunity to try the method with normal children came when the Director General of the Roman Association for Good Building invited Dr. Montessori to organize infant schools in some of the model tenements which the Association owned. These tenements were for the most part located in the poorest parts of Rome. Each was built about a court and occupied an entire block. Rooms opening out into this court were set apart for schoolrooms, and these were furnished in accordance with Dr. Montessori's plans. There was little of the conventional school equipment. Small tables and chairs took the place of the fixed desks and seats. The didactic material which had been used with the deficient was modified and here took the place of the usual kindergarten and elementary school apparatus. The schools were called the *Casa dei Bambini,* or The Children's Houses. The first one was opened in January, 1907. The methods which were used in these schools have been adopted by many of the schools in Italy and Switzerland and in several of the larger cities elsewhere.

The essentials of the system advocated by Dr. Montessori may be considered under two general headings. The first is a strong emphasis on sense training. This sense training is first of all for general development. For this purpose there are many different pieces of apparatus designed to train the several senses. In order that the child may gain perception of form, there are various wooden insets similar to those used by Itard and Séguin. The child learns to recognize the form by passing the fingers around the edges of the insets and then putting them in their proper places. Perception of dimensions is secured through the use of blocks in which cylinders of various dimensions are set in holes. There are also blocks of various sizes from which the child may make stairs, thus gaining a perception of size and length. Perception of color is secured by using silk bobbins of different colors and shades. In each case the material is so planned that the child may correct his own errors. If he fails to put the cylinders in the proper holes, he cannot get all of them in. If he does not place the blocks in proper order, they do not make stairs. Some of the material is planned to serve as a preparation for the school arts. Letters cut from sandpaper are pasted on cards. The children by passing their first two fingers over these are supposed to gain such muscular control that they are better able both to write the letter and to associate the sound. Other letters are cut from cards, and with these the children build up words and sentences.

In addition to this somewhat formal sense training for general development, there is a large amount of incidental sense training which is gained through such activities as buttoning and lacing cloth or leather fastened on frames. Further, the courts or gardens connected with these schools are also used in training children to observe flowers and plants as well as birds and small animals kept as pets.

The second essential feature of the Montessori method is the great stress laid on the freedom of the child. This means that the teacher is expected to observe and direct the activities of the children rather than to control them. To accomplish this the teachers or directors are expected to measure the child's growth, record any significant fact regarding his development, and at different times test his advancement in order that they may know how best to deal with him. The large degree of freedom allowed and the individual treatment are features which differentiate these schools markedly from what one customarily finds elsewhere. This principle of freedom is carried out in the theory of discipline. The materials and exercises are of such a nature that the child is led to correct himself. If, in moving about, the child upsets a chair, the noise at once makes him understand what his error has been, and it is expected that the annoyance to others will cause him to avoid such mistakes in the future. In this way self-control is to be secured. As so far used the method has been applied only to children of the kindergarten and early elementary school age. There is promise, however, of experimentation looking to its extension into higher grades.

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MONTESQUIEU, CHARLES LOUIS DE SECONDAT, BARON DE LA BRIDE ET DE (1689–1755). — French philosopher, statesman, and scholar. He was educated at the Oratorian school at Juilly, and served as councilor in the parliament of Bordeaux for twelve years, the last ten years as president. Subsequently removing to Paris, he was elected a member of the French Academy (1728). His principal writings are: *Lettres persanes* (Amsterdam, 1721); *Considérations sur les causes de la grandeur et de la décadence des Romains* (Amsterdam, 1734); *L'esprit des lois* (Genève, 1748). Book IV of the last work contains several chapters on education, one of the striking statements found therein, though it is by no means peculiar to Montesquieu, being: "The laws of education vary as the government" — a truth that gives us the keynote to the kaleidoscopic transformation in the educational system of France during the revolutionary period, and that goes far toward explaining the different national educational ideals. F. E. F.

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MONTEVIDEO, UNIVERSITY OF. — See Uruguay, Education in.

MONTHLY JOURNAL OF EDUCATION. — See Journalism, Educational.

MONTPELLIER, UNIVERSITY OF, FRANCE. — One of the earliest of the medieval universities, a medical school being referred to in 1137. It is doubtful how the institution originated, but it is certain that the population was mixed, and Saracen, Arabic, or Jewish influences may have been strong, although this view is balanced by the great power which the Church always enjoyed. The medical school was certainly free and unrestricted about 1180, but the organization of other universities was soon imitated; but side by side with the strong gild principle went the authority of the Bishop of Maguelone. The earliest definite mention of a university at Montpellier is found in statutes of 1230, when a chancellor is nominated by the bishop. The growing democratization of the student body led to constant opposition to episcopal authority, which was only settled in 1340. The Montpellier medical school was for long the center of the cult of Hippocrates and Galen. The study of law, civil and canon, was also pursued at Montpellier from the twelfth century, and before a university is heard of, well-known jurists like Placentius (author of a *Summa Codicis* and *Summa Institutionum*) and Bassianus taught there and intimate relations were maintained with Bologna. A *Studium Generale* was formally established in 1289, and, as in the medical school, a struggle went on between the bishop and the *studium* until an arrangement was reached about 1340. In 1421 the faculty of theology, which subject had been studied in connection with the Carthusian monastery, was added to that of law, while the faculty of arts which had existed certainly since 1242 was also attached to the legal faculty. For many reasons — war, plague, and the rise of the university at Perpignan — Montpellier declined in the fourteenth century. The medical faculty, however, enjoyed a renewed period of prosperity as a result of the Renaissance and the revived interest in Hippocrates and Galen (Rabelais, *q.v.*, lectured there on the former) and through the patronage of Henry IV and the excellent work in surgery it acquired a considerable reputation. In 1572 a college of pharmacy was established in the town. In 1593 a botanical garden was laid out, and the first chair in botany was established in 1597. In the seventeenth century chairs were founded in chemistry, physics, mathematics and hydrography, and French law. The arts school was under the control of the Jesuits from 1629 to 1762. During the Revolution the university with the exception of the medical school suffered the same fate as the other higher institutions. With the reorganization effected in 1808 separate faculties of science and letters were established; the medical faculty had been reorganized in 1803; in 1840 the school of pharmacy became a part of the university; in 1878 a faculty of law was revived. Other institutions connected with the university or located in the town are an agricultural school, a forestry laboratory, a meteorological laboratory, a school of commerce, a school of fine arts, a conservatory of music, and an institute of historical science. Special provision is made for foreign students to study the French language, literature, history, and national institutions. The student enrollment in 1909–1910 was 1958 (law, 744; science, 282; letters, 134; medicine and pharmacy, 798).

See France, Education in.

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MONUMENTA GERMANIÆ PÆDAGOGICA. — A comprehensive publication modeled on the *Monumenta Germaniæ Historica.* The work was conceived by Dr. Karl Kehrbach, and is now published under the auspices of the *Gesellschaft für deutsche Erziehungs und Schulgeschichte,* founded by Kehrbach in 1890. As originally planned the work was to cover all aspects of education in German-speaking countries from the humanistic period. On further consideration it was decided to begin with the early medieval period. The first volume appeared in 1890. The work deals with education in its broadest sense. It is divided into four departments: (1) School ordinances (church, state, and municipal), including school regulations, visitations, constitutions of orders, letters of appointment, synodal acts, and salary scheme, oaths of office, statutes of hostels, dormitories, etc. (2) School textbooks. (3) Educational treatises and systems; biographies; school addresses; table manners; regulations for education, poems dealing with education, and colloquies; correspondence of schoolmen; school plays. (4) Dissertations dealing with the place of the above in education. The school ordinances are treated from historical, bibliographical, and textual viewpoints; the textbooks from the viewpoints of subject matter and history, pedagogy, text, and bibliography. The work is necessarily not published at regular intervals or in any defined order. Up to the present there have appeared forty-eight volumes, the general contents of which are given in the following list: —

Volume I, VIII. Brunswick School Ordinances up to 1828.
Volume II, V, IX, XVI. Ratio Studiorum et Institutiones scholasticæ societatis Jesu per Germaniam olim vigentes.
Volume III. History of Mathematical Instruction in Germany up to 1525.
Volume IV. German Catechisms of the Moravian Brethren.
Volume VI, XIII. The Transylvanian-Saxony School Ordinances.
Volume VII. Philip Melanchthon as Preceptor of Germany.
Volume X, XI, XV, XVII, XVIII. History of Military Education and Training in German-speaking Countries.
Volume XII. The *Doctrinale* of Alexander de Villa Dei.
Volume XIV. History of Education of the Bavarian Wittelsbachs up to 1750.
Volume XIX. History of Education under the Wittelsbachs of the Palatinate.
Volume XX, XXIII, XXXIX. Evangelical Catechisms before Luther's *Enchiridion.*
Volume XXIV. School Ordinances of Baden.
Volume XXV, XXIX, XXXI. Pestalozzi Bibliography.
Volume XXVI, XXXII. The Educational Reform of Comenius in Germany up to the End of the seventeenth Century.
Volume XXVII, XXVIII, XXXII. School Ordinances of the Grand-Duchy of Hesse.
Volume XXX. Austrian Education at the Time of Maria Theresa.
Volume XXXIV. Youth and Education of the Electoral Princes of Brandenburg and the Kings of Prussia.
Volume XXXV. Commercial Education in Berlin in the Eighteenth Century.
Volume XXXVI, XXXVII, XL. Youth of Frederic William IV of Prussia and of Emperor and King William I.
Volume XXXVIII, XLIV, XLV. Education in the Grand-Duchies of Mecklenburg-Schwerin and Strelitz.
Volume XLI, XLII. Documents on Secondary Education in Bavaria, including Regensburg.
Volume XLIII. Andrea Guarna's *Bellum Grammaticale* and its Imitators.
Volume XLVI, XLVIII. Higher Education in Prussia under the Superior School Council (1787–1806) and the Abiturientenexamen.
Volume XLVII. Documents on the History of the Humanistic Schools in the Bavarian Palatinate.

MOOD. — The general emotional tone of one's consciousness is sometimes pleasurable or unpleasurable for a considerable period of time. Under such circumstances, the individual is said to be in a pleasurable or unpleasurable mood, as the case may be. The mood does not consist in a single emotion, but rather in a persistence of a general type of emotional attitude. On the other hand, mood is to be contrasted with temperament as a relatively transient phase of experience. A person who is of a sanguine temperament will continue day after day to be in an optimistic state of mind. One may have an optimistic mood for a period of time without having the general temperament characteristic of the optimist. The control and education of an individual so that his mood may be developed into a permanent temperament is desirable, provided the mood is of a favorable type.

For a discussion of this topic, see Emotions.

C. H. J.

MOOR'S INDIAN CHARITY SCHOOL. — The name given by Rev. Eleazer Wheelock to his Indian school, which he opened in 1754, in recognition of a bequest by Mr. Joshua Moor of Mansfield, Conn. The school was first established at Lebanon, Conn., and in 1785 was moved to Hanover. When the institution was chartered as Dartmouth College, the education of Indians gradually became secondary, the school being chartered as a separate institution in 1807. It continued until 1849.

See DARTMOUTH COLLEGE; INDIANS, EDUCATION OF.

MOORE, ZEPHANIAH SWIFT (1700–1823). — College president. He was graduated from Dartmouth College in 1793; was for thirteen years pastor of a church at Leicester, Mass.; four years professor at Dartmouth College (1811–1815); six years president of Williams College (1815–1821); and two years president of Amherst College (1821–1823).

W. S. M.

MOORES HILL COLLEGE, MOORES HILL, IND. — A coeducational institution founded in 1853 and opened in 1856 under the auspices of the Methodist Episcopal Church. There are maintained an academic, collegiate, agricultural, commercial, music, and art department. The college entrance requirements are sixteen units. Classical, scientific, and literary courses are offered, leading to their respective degrees. The enrollment in 1911–1912 was 270. The faculty numbers twenty-one members.

MORAL CHARACTER. — See CHARACTER.

MORAL EDUCATION. — The problem of moral education in the schools is very complicated. First of all, the present status of the teaching of morals is the result of a long and varied history, the phases of which are reflected in many of the problems of to-day. Again, the nature of the moral sense, and the relation of morality to the general aim of education are both matters upon which a variety of opinions are held. These different views have given us antithetic practices, and to-day the educational world cannot be said to show any marked agreement as to the general place of morality in the educational scheme, the method of moral culture, or the subject matter of moral instruction. An exposition of the situation at present in regard to moral education requires as an introduction a consideration both of the main trend in the history of moral culture and of the various philosophical and psychological theories concerning the development of the moral sense.

Four Historic Movements in regard to Moral Culture. — The history of moral culture presents among others four issues which are to-day especially fruitful of difficulties to the school that engages in this task. These issues concern (1) the progress from customary to reflective morality, (2) the association of morality with religion, (3) the evolution of academic from utilitarian morality, (4) the variety in moral standards among different peoples and in different ages.

(1) In primitive society morality is wholly a matter of custom. Indeed, the word "morality" is derived from *mores*, or customs. These mores controlled the moral sense of early man. Even to-day they are, perhaps, the dominant factor in the moral life. Whatever is in the mores, the sociologist Sumner declares, is felt to be right. These customs constitute the social adaptations that society has established as a result of blind and uncomprehended experimentation. However, with the progress of time men get a wider outlook, which reveals to them the mechanical foundations of much that had seemed like the sacred utterance of an inner voice. Some mores come in conflict with others as people migrate and get into contact with strangers. Other mores are outgrown, and history preserves for our amazed study the intense moral allegiance of our forefathers to practices toward which we feel only indifference or contempt. Thus man advances toward an age in which morality is no longer merely a matter of the mores, but seeks a rational foundation in some universal laws of social and individual life.

Morality tends to become reflective by yet another process. The mores find substantial help in such specific instruction as can be added to supplement the cultural effect of imitation. This instruction tends to become generalized in rules of practice. These are at first mere summations of existing mores, but with the progress of time they come to include reasons and to strive to reconcile inconsistencies that are laid bare as various principles are drawn into a system. Thus instruction in morality constantly tends to make it reflective, critical.

But the tendency to make morality reflective weakens the implicit faith in the mores. What is consecrated by habit and feeling is desecrated by reason. Habituation in the mores, which we may call moral training, and reflective criticism of them, which is almost a necessary implication of moral instruction, do not always support each other. In this emergency we find a gradual differentiation of two parties. One consists of those who reverence the mores and would limit moral culture to habituation in them, possibly supplementing this by such dogmatic instruction as can be made to strengthen their grip on conduct. The other comprises those who would make all morality of the reflective critical type. Such was the view of Socrates and of Plato in his earlier years. Their notion that virtue is knowledge, and can be taught, may be regarded as essentially an abandonment of the mores in favor of a reasoned course of conduct. There is yet a third party, in which we may group those who hold, as did St. Paul, that we may know the better, yet do the worse. On this view, while morality should be based on reflection, it must be ingrained in character before it becomes effective. This result can be reached only by habituation, by will. Thus moral training is again invoked, not as the basis of the moral life, but as the only agency by which the dictates of reason and conscience can be put into practice.

It is evident that these various points of view are implicated in the attitudes taken to-day toward moral instruction in the schools. Those who feel that morality is a matter of the mores, if they want moral culture in the schools, have in mind, as the substance of this, habituating training plus a little instruction preceptive in character. Some, however, think that this dogmatic instruction will take the spirit out of the habits that it is designed to aid. They hold that moral culture should be indirect; that we get it best by growing into it, rather than by having it preached to us; that to state in rules the principles that should constantly be exemplified in habits is to deal in platitudes. There is life in such precepts when we live them, not when we merely talk about them.

On the other hand, those who would found morality on reflection may hold that it is beyond the reach of children, and so exclude it from the studies of the elementary schools; or if they have a more favorable notion of the capacity of the child, they may wish the classes seriously to discuss the vital problems that constitute mooted issues in the life of the day. It is evident that instruction in morals does not go far before it reaches the plane of reflective morality, and that this is critical, interested only in that which is not yet a matter of habit or in that habit which is questionable. It tends to disintegrate and to reconstruct the mores. Otherwise it has little ground for being.

(2) The association of religion with morals is very largely responsible for the situation to-day in reference to moral instruction. In the very beginning of conscious endeavors to supplement the mores by direct teaching, religion played a prominent part. The customs that society was most anxious to emphasize involved as a rule individual self-restraint, often individual sacrifice for community welfare. In making a conscious appeal on behalf of such mores the belief in the supernatural was of the greatest help. Instruction appeals here, as always, to the reason, but to a reason uncritical of the products of its imagination. In religion instruction found something new and fresh that could be used to reënforce the mores rather than to cause one to grow weary or skeptical of them. Moral instruction in the guise of religion can interest and inspire. The mind is lured away from the commonplaces of everyday life and invited to speculate about the rewards and punishments of the invisible powers that preside over the destiny of man. The glory and the terror of such unexplored experiences are a never failing stimulus to the imagination.

In modern times the struggle over freedom in religious matters has resulted in the removal of much or all religious instruction from the national schools in democratic communities (see Religious Education). The historic association of moral and religious instruction has caused the latter to carry the former with it out of the curriculum. France after the Revolution and the United States illustrate this tendency best among the larger states. In many cases such religious organizations as possessed a more or less adequate system of schools under their own control resisted the development of the national schools, holding them to be Godless institutions, calculated to sharpen the wits rather than to cultivate the conscience. It has even been urged that nonsectarian education produces crime, and in proof thereof shown that the amount of crime as indicated by the statistics increased with the development of state schools. A more careful examination of the data made clear, however, that the apparent increase of crime was due to the addition of new causes of arrest, such as drunkenness, or to the more accurate keeping of records of arrests, or to the greater vigilance of the officers of the law. In point of fact, the data seem to indicate that education, even though it does not include specific moral instruction, tends to reduce crime by increasing efficiency, and so diminishing in a measure the incentive to crime.

However this may be, there has seemed much reason to deplore the lack of more positive instruction in morals in the schools. In order to make up this deficiency and yet keep out instruction specifically religious, efforts have been made to develop a system of morals not based on religion. Here some have dissented and maintained the inseparability of the two. Especially in England this view has found many supporters. Since the public elementary system there was until 1870 entirely in the hands of the voluntary associations of either the Church of England or Dissenting Denominations, religion has had in them a prominent place. When schools were later established independently by the public authorities, a little undenominational religious instruction was given in them, and moral teaching was connected with it. In France, where, perhaps, religion has been more completely excluded from state schools than in any other European country, we have the most definite attempt to develop moral instruction independently. The law of 1882 required a certain amount of moral and civic instruction. At the same time, one day a week in addition to Sunday was allowed the children that the parents might, if they would, provide religious instruction outside the schoolhouse. In Germany religious instruction is regularly given in the state schools by or under the supervision of the pastors of the various churches in the localities. To-day not only Catholics and Protestants, but also Hebrews, have a chance to determine this religious instruction. Moral instruction is closely connected with the religious teaching. The German plan prevails, in general, in Switzerland. In European countries where one denomination is not only the state religion, but is also in control of the situation, the religious and moral instruction in the school centers about the ideas and practices of that denomination. Thus, so far as the connection between religion and morality is concerned, we have five types of schools, as follows: (1) Those schools in which there is neither specific religious instruction nor *set* lessons in morals. Such are most of the public schools in the United States and many of the private schools as well. However, almost, if not quite, invariably the public school regulations in the various states enjoin the teachers to provide *incidental* moral instruction as well as to care constantly for moral training. (2) Those schools that provide no religious instruction, but have developed a special course of study in morals and civics. This type is illustrated in the state schools of France, where, although a general recognition of a Deity is approved, very little, if any, religious instruction is given. (3) Those schools in which undenominational religious instruction has been made a feature of school work, and the moral instruction associated therewith. This method may be said to be that aimed at in the English elementary schools established by the public authorities. The parents may, if they wish, withdraw the children from the periods devoted to religious instruction. (4) Those schools in which religious and at least partially denominational instruction is given under the control of the various denominations in the locality. Here moral teaching springs out of the religious teaching. This system is illustrated in Germany and Switzerland. (5) Those schools in which religious instruction according to one faith is given, and moral instruction made largely dependent thereon. Such a system prevails in the state schools where one faith, as the Roman Catholic or the Lutheran, is in control, or in the schools maintained by the various denominations.

In general, it may be said that moral instruction receives most attention where there is enough religious study to give it large foundations and emphatic attention, as in the denominational schools of the fifth type, or where it is developed independently of religion, as in the schools of the second type. The attempt to make moral instruction dependent upon undenominational religious instruction, or upon such denominational instruction as may be given by officials not in the regular teaching force, or in periods sharply separated from the rest of the program, does not yield vital results, inasmuch as a broad enough religious basis cannot thus be given to interpenetrate very thoroughly the moral life. In consequence, those who hold that moral instruction should be founded on religion are likely to advocate much more religious teaching in the secular schools, or to propose to base moral instruction largely, if not wholly, on religious agencies outside of the school.

(3) The historic movement from utilitarian to academic morality has been a factor in determining the present nature of the problem of moral education. When men began first to reflect upon the reasons for the prevailing mores, they searched for utilitarian ones. The customs must be upheld, they thought, because only thus can the prosperity of the individual be assured. This springs from the fact that the mores are founded either upon natural law or, as is usually the conception, upon the supposed will of the supernatural powers. Especially such practices as may make for the welfare of society rather than for that of the individual are found to take refuge behind the theory of authorization by a divinity. When, however, long experience reveals no demonstrable connection between self-sacrificing obedience to divine law and personal prosperity as an ultimate reward for such service, men seek another justification for it. They rise from the notion of prudential morality to the Stoic conception of " right for right's sake." They find in conscience the only guide, and regard the conduct that has for its motive hope or fear of consequences as not genuinely moral. If they associate happiness at all with moral conduct, it must spring from the consciousness of duty done rather than from the worldly success thereby achieved.

However, when men reflect further, they may conclude that after all the happiness of the individual is the only justifiable end of moral conduct, that morality is merely the highest sort of prudence. The utilitarian finds his explanation of the altruistic conduct of man in his social nature, which cannot be happy when surrounded by unhappy companions. He would, therefore, make moral education consist largely in the study of consequences and such culture of habits and will as enables one to carry into practice the bidding of the knowledge thus acquired. Here we have the conception of moral culture entertained by Rousseau and Herbert Spencer. The child is to be subjected to the discipline of natural consequences.

Opposed to the utilitarians are the rigorists like Kant, who maintain that morality is a matter of obedience to absolute law and cannot be based on the calculation of consequences. Hence, in their view, moral culture consists not in any revelation of relations between cause and effect to be derived from experience, but rather in rousing to free utterance an inner voice. On the question of the nature of this inner insight we have the rationalism of Kant opposed to intuitionism. Kant founds morality on reason, — not empirical reason, which investigates consequences, but pure reason, which reveals the right in itself. Such rightness, he holds, consists in conformity to the absolute moral law, the universal categorical imperative. One may act rightly and yet apparently bring disaster to himself and others. True moral culture consists, therefore, in endeavoring to rouse the attitude of good will which considers only the form of the act, and is careless of consequences. The intuitionists hold that the awareness of the right is not even reasoned out, but is a matter of direct perception. To teach morality becomes, on their view, analogous to teaching one to use his eyes. We do not learn a moral law and then apply it, as Kant supposes, but we simply look steadily at what we think of doing, and its rightness or wrongness becomes immediately apparent.

(4) Finally, among the historic facts that have entered in to determine the character of the problem of moral instruction to-day is that of change and variety in the moral codes. The notion that in morality we have something which differs from religion in that there is universal agreement as to its nature and rules is evidently erroneous. Historically the views of mankind in regard to the rightness of acts have changed quite as much as their notions of religion. For example, infanticide and cannibalism and harlotry have been held to be sacred when properly carried on. To-day the common judgment of the enlightened seems to be united in abhorrence of them. Yet many among the so-called enlightened feel no horror at some sorts of infanticide or of sexual intercourse not recognized by law; indeed, they justify them. And while the exceptions to those who to-day concur in regard to these fundamental matters are, perhaps, few, the unanimity in regard to just what is permitted in the matter of the relations of the sexes, just what is involved in veracity or business honesty or intemperance or in proper service to the state or proper regard for parents, for servants, or for charity is certainly very scant. If the school is to keep to the universally recognized in morality, it seems to be confronted with the necessity of dealing only in generalities and platitudes. Among the special bits of ethical instruction to be found in textbooks widely used in the French schools is this in regard to the attitude of children toward parents: " Do not be familiar with them as you are with your companions." The interpretation of this principle by different households, and especially in America, would evidently vary greatly.

Various Views on the Psychology of the Moral Sense. — The problem of moral culture to-day is further complicated by conflicting views as to the psychology of the moral sense. Fundamental among the issues involved here is that between those who regard moral development as essentially a negative, inhibitive process and those who hold that it is at bottom positive, constructive. According to the first party moral education is a purging away of original sin, a purification of the spirit from the taint of flesh, a war against selfishness, or a curbing of the brute that we inherit in the interest of the higher civilization of to-day. This control of our baser nature may be conceived to be dependent upon the influence of the rewards and punishments established by the temporal and the spiritual rulers who determine our fortunes here and hereafter, or upon the wisdom that has come to perceive the penalties that nature visits upon those who permit their appetites and passions to control them, or, finally, upon the birth of an inner conscience, a spiritual quality, — the product, perhaps, of Divine Grace, by virtue of which one comes to despise his inferior self. In any event, the function of the teacher is held to consist in the task of getting the lower nature under control. He is a lawgiver, threatening and punishing, a prudent adviser, pointing out the folly of evil ways, or a preacher, shaming the self-indulgent, the dishonest, and the base by exhibiting their shortcomings to themselves and to others.

The advocates of the constructive ideal of moral culture maintain that all, or at any rate most, of the human desires have a function, that the task of self-control is not so much that of suppressing the evil as it is that of encouraging the good. Among the extreme advocates of this view is Rousseau, who held that man is born good and corrupted by education. Hence, with him the ideal education is to let the child alone, for in its natural development will be found the best culture. The more moderate conception is that, while the natural child or man is by no means morally perfect, yet he does have in him the qualities the right development and harmonization of which will make of him an ideal individual. Moral culture should, therefore, aim, not at suppression, but at an harmonious development of all the powers, at self-realization.

In addition to their view that all, or nearly all, the human instincts have a place in the properly trained man, the advocates of the constructive sort of moral culture hold that the control or the suppression of the undesirable can take place only by substituting something better. This substitute can, they think, be found only in the nature of the child. The negative discipline is, therefore, held to be faulty in that, in aiming merely to suppress the undesirable, it leaves to chance or to the undirected impulse of the child the selection of a substitute interest by the ascendency of which alone control of the objectionable quality is made possible. Inhibitive education at best merely gets rid of an evil without assuring itself that something better takes its place.

A second issue in regard to the psychology of the moral sense is that between those who emphasize freedom and those who hold that cultural influences are essential to morality. The idea of transcendental freedom, advocated by the followers of Kant, led them to minimize the importance of circumstances in the development of morality. Kant's notion was that the one absolutely independent thing about the individual is the moral will. To make it depend upon educative influences seemed to be to take from it its unconditioned character. Herbart, on the contrary, held that from the point of view of the concrete problems of education transcendental freedom is a myth. All education, he asserted, aims at moral character, and to maintain that culture has no reference to the moral will is to deny that the teacher and the school have any serious value. Education, he claimed, should not passively wait for the moral nature to assert itself, but should continually endeavor by the presentation of appropriate experience, which he characterized as an "æsthetic presentation of the world," to stir up many-sided interest and to cultivate that union of judgment with desire which insures a comprehensive, just, and steady will. Both Herbart and Kant agree that morality is a matter of inner insight. To get this, one must have that in his nature which responds to and evaluates the moral situation. Kant, however, does not think that this moral judgment is *a posteriori*, or derived from experience, but rather *a priori*. Experience is moral because we make it so by judging it, and the judgment of conscience is not a result of instruction. Herbart, on the other hand, declares that it is to be evoked only by the continued presentation of phases of experience in reference to which it can express itself. The child becomes moral by constantly beholding and reacting to moral activity in others.

In more recent years this inner response to moral situations which Herbart held to result from familiarity with them has been traced to the ripening of certain instincts. The keener conscience of the older child is thus attributed not to his experience, but to his maturity. As to the character of the instincts that lie back of moral character, there is a difference of opinion. One school revives the conception of Rousseau, who held that up to adolescence the child is purely self-regarding and should be disciplined only through an appeal to his experience of the pleasant and unpleasant consequences of his acts. In the instincts of puberty, the interest in the opposite sex and later in one's children, he found desires that tend to break down the self-centered life and to create broader sympathy and an altruistic moral sense. President G. Stanley Hall agrees with Rousseau in emphasizing adolescence and the parental instincts. According to him the life of ideals is born and reaches its climax in the "storm and stress" of youth. Kirkpatrick in his *Fundamentals of Child Study* includes among the instincts that have a bearing upon moral development not only the parental, but also the social and regulative instincts. Under the social instinct he ranges fondness for society, love of approbation, sympathy, and altruism. Under the regulative instinct he places the moral instinct proper and the religious instinct. The former he reduces to the tendencies toward self-control and toward evaluating conduct and developing ideals. Altruism, the genuine religious attitude, and the sense of independence and responsibility, he regards as not much in evidence before adolescence. The period before adolescence in his view is, therefore, merely preparatory so far as morality is concerned. The experience, the habits, and the knowledge of objective values to be gained in this preparatory period are, however, regarded by him as of the highest importance.

Morality and the Aim of Education. — An important phase of the theory of moral culture is concerned in the relation of morality to the total aim of education. Liberal education has from time immemorial occupied itself with ethical culture, especially its civic and social phases. But the development of leisure led to phases of culture calculated to minister rather to individual gratification than to social service. In consequence, liberal education came to aim at knowledge and beauty as well as at strictly ethical qualities. Later, the development of unworldly religions with the attendant emphasis on the spiritual life as compared to the life of sense, led to the elevation of the religious above the moral aim of education. Still later, the Enlightenment of the eighteenth century found in personality its supreme concept. The struggle for the rights of the individual, for freedom, for self-realization, displayed itself in all phases of human life, — political, social, economic, artistic, and educational. In education the ruling notion of self-realization tended to draw all liberal culture into a unity. The religious, the scientific, the social, and the æsthetic interests were held to be mutually dependent phases of a developing personality. The goal of such development Herbart found in moral character, which to him meant volition controlled by the broadest insight into and sympathy with the various interests of men. In his system, therefore, morality is so broadly interpreted as to be restored to its ancient position as the sole aim of liberal culture.

The Herbartians regarded history, or the account of the human will in action, as the fundamental subject for the development of moral character. With it was closely associated literature. Science and mathematics and, indeed, all the subjects of the liberal curriculum were held to have an ethical bearing, and to justify their place therein because of this fact. Moral instruction, therefore, comes to consist not in certain rules of conduct taught in connection with religion or separated from the rest of the course of study, but in all the studies of the school. It is their essence. Similarly, moral training was regarded as the whole of the discipline of the school.

The Herbartian conception united in the notion of moral culture all the various historic aims of liberal education. However, it held to aristocratic traditions in excluding the vocation from the liberal ideal. Thus vocational instruction was not regarded by Herbart as an essential phase of moral culture. The democratic and industrial movements of the nineteenth century have brought preparation for the calling forward as an indispensable factor in education. Those who agree with Herbart in regarding vocational education as not aiming at moral character, and at the same time sympathize with the modern demand for training to make a livelihood, are compelled to enlarge his statement of the educational ideal. The expression, efficiency, or in Spencer's phrase "preparation for complete living," has been the most generally current symbol for the aim of education. The extent to which human efficiency is a matter of social adaptation has led this ideal to be characterized as social efficiency. Put in this form, it is capable of a moral interpretation. If morality is character in action in a social environment, then social efficiency must be held to be an essentially moral aim. Indeed, Professor Dewey, in finding moral education to consist in making instruction live in the activities of the child, has defined it broadly enough to make it include all sound education. Culture that is the union of thought and action in a social world which reproduces the essential problems of human life and gradually approximates to the social environment of the adult is evidently both moral and vocational. Just as Herbart enlarged the notion of moral character to include all the products of liberal education, so our modern democratic education would seem to be widening it to embrace the vocational efficiency so much demanded to-day.

Present Agitation in Regard to Moral Education. — The issue of moral education is to-day rapidly forging to the front as one of the leading problems of the school. In France since 1882 specific moral instruction has taken a place in the curriculum. It must be said, however, that this has not always seemed either to French or to foreign observers entirely satisfactory. Especially has it been attacked by the clergy. Since the suppression of the religious associations and the consequent disappearance of nearly all the Catholic schools, the question of the adequacy of the moral instruction received by the French children has been very much in the foreground. In England the issue of moral instruction has also become prominent, stirred up especially by the struggle over denominational control in elementary education. A commission on moral instruction and training, self-constituted, but containing many of the leaders in education, published in 1908 and 1909 an extensive and valuable report on conditions and opinions in reference to this matter in many countries. In the United States for many years the need of more attention to moral education has been discussed. In the convention of the National Educational Association held in Los Angeles, Cal., in 1907 a resolution was passed to the effect that "It is the duty of the teachers to enter at once upon a systematic course of instruction, which shall embrace not only a broader patriotism, but a more extended course of moral instruction, especially in regard to the rights and duties of citizenship, the right of property, and the security and sacredness of human life." A committee was appointed which made in 1908 and again in 1909 reports on various aspects of moral culture. At the latter meeting certain papers recommended special instruction in morals as part of the curriculum. The idea that this should take the form, not of dogmatic precepts, but of a rational attack on living issues with the aim of developing conscience through reflection was put forth. Experimental efforts in this direction have been made, as, for example, in the course designed by Professor Sharp of the University of Wisconsin, and tried in some of the high schools of that state, in the illustrated lessons prepared by the National Institution for Moral Instruction, through its secretary, Milton Fairchild, and in courses given in progressive schools, especially the Ethical Culture School in New York City. The Ethical Culture School (*q.v.*) owes its origin principally to the efforts of Professor Felix Adler, to whom is to be credited one of the earliest positive attempts to introduce the specifically moral element into American education. This movement led to the formation of a number of Ethical Culture Societies. Among the most influential agencies at present engaged in the movement for moral education in the United States is the Religious Education Association, a voluntary society founded in 1903. This organization held at Providence, R.I., in February, 1911, a convention especially devoted to the subject of moral education, and in its *Journal* for that date it gives one of the most comprehensive summaries of the conditions in the United States in regard to moral education that we possess. It reveals great diversity of opinion, but so far as practice is concerned the prevailing custom is to trust to other agencies than specific courses in morals. State laws or courses of study often emphasize the need of moral instruction, but they do not, as a rule, make such definite provision for it as to insure that the schools should give to it an assigned amount of time and attempt to cover a certain clearly defined field. Here and there where in counties, in cities, or in individual schools the personal supervision of one superintendent makes possible unity of conception and practice, there have been worked out fairly definite schemes of moral instruction. Legislation has, in general, laid stress upon instruction in the duties of citizenship, on the bad effects of alcohol and narcotics, and occasionally on the humane treatment of animals. (See HUMANE EDUCATION.) It has required teachers to be of good moral character, and provided for the punishment of both teachers and pupils for immoral conduct. It is very rare, however, for licenses to be withdrawn for this cause. As for the preparation of teachers for giving moral instruction, the curricula of colleges and of normal schools provide, aside from a course in ethics, very little that has much bearing thereon.

Various Views as to what should be done in regard to Moral Education. — When we come to the problem of providing adequate moral culture in the future, we find that the complexity of the factors involved results in a corresponding variety of opinions and suggestions. Five main opinions may be distinguished, although each of these may be subdivided according to particular views on minor points.

(1) A very considerable number hold that moral education requires no addition to the agencies at present at work in the schools. The chief forces in moral culture are, on this view, the personality of the teacher, the discipline of the school, the moral insights and ideals to be derived from the ordinary studies, incidental instruction in moral notions and practices by the teacher and by occasional speakers from outside the school, and intercourse of the children with each other on the playground and in school organizations. Of all these forces the personality of the teacher is usually held to be the most important. If it be of the right sort, it is trusted to inspire the pupils and to be a constant model for imitation that goes on in the main unconsciously. In this agency alone, many believe, lies the solution of the entire problem of moral culture, for, in the last analysis, character can be understood only in terms of the experience that comes from actual contact with it and practice in its ways. Moreover, the discipline of the school, the efficiency of which is so important an element in moral culture, depends upon the personality of the teacher. The sympathy and the justice, the patience and the firmness, the refinement and the strength, the ideals and the common sense of this individual find their expression in the rules of conduct of the school, and especially in the spirit in which they are enforced. Thus through the habituating effects of his steady supervision the momentary inspirations of the child are converted into the traits of a character.

The Herbartians value highly this personal contact, but especially do they emphasize the moral value of the course of study. The importance of each subject is, they hold, in proportion to its reaction on character. This principle determines the selection and arrangement of the curriculum. History and literature show character in action, and thus create ideals and standards, *i.e.* moral intelligence. Other subjects are made contributory to these, completing the circle of thought and perfecting the sympathy and the judgment. While the Herbartians emphasized the moral value of the content of the studies, the Disciplinarians lay all stress on their form. In the preëminently formal work of the languages and of mathematics they find a discipline of the will to attentiveness, persistence, accuracy, love of truth, etc. When we add to these agencies for moral instruction the life on the playground and in the school societies, we are able, in the opinion of many, to cultivate adequately the additional virtues of courage, tact, self-control, regard for the rights of others, and sense of obligation for public service. Finally, unusual occasions in the life of the school, such as the celebration of an anniversary, the advent of a stranger who will address the pupils, or some crisis demanding an appeal to the spirit of the general body, for example, athletic contests or a reform in bad practices, such as cheating in examinations, — all these afford constant opportunity to promote and to revive healthy moral life.

Those who hold the present agencies to be adequate for moral culture may, and often do, feel a need for greater efficiency in regard to some or all of them. They frequently urge the need of better selection of teachers from the point of view of personal influence, of discipline that will be more effective in developing moral strength, of more careful selection of history and literature with a view to the ethical effect thereof, of such methods of instruction as will more successfully bring out ethical ideas, of more sympathy on the part of the teachers with the play of the child or with his social life and home conditions, of more careful supervision of such of these interests as can be influenced by the school, or of more frequent departures from the routine of the school work in order to introduce an exercise having ethical significance. The study of physiology and hygiene should, many think, include instruction not only in the effects of alcohol and tobacco, but also in matters pertaining to sex. Similarly, the work in history and civics should include more attention than is commonly given to the obligations of the individual in regard to public service. All these reforms involve no radical transformation of the school as at present organized.

(2) A second party consists of those who hold that the key to effective moral instruction is to be found only in religion. They would, therefore, either introduce more religion into the schools or look for the needed betterment of moral education largely to independent

religious agencies, which they would develop to greater efficiency in this field. The various solutions of the problem of the relation of moral and religious instruction have already been dealt with. In general, it may be said that, although the present movement in favor of more moral education has been greatly promoted by those interested primarily in the religious life, still comparatively few look for reform through an increase in the amount of religious instruction in the schools. (See RELIGIOUS EDUCATION.)

(3) A very considerable number hold that what we need is not more or different moral *instruction*, but rather the development of new and more effective agencies for moral *training*. Two plans are advocated, each of which has been experimented with. The one strives to develop the idea of student self-government (*q.v.*) so as to awaken in the child as soon as possible the sense of responsibility under the stimulus of sharing in the work of making and administering law. The George Junior Republic (*q.v.*) is, perhaps, as complete an illustration of this conception as we have. Although designed primarily for wayward youth living and working together in a small community, it embodies ideas of self-government that many think should be far more completely realized in every school than they are at present. By such methods it may be possible not only to turn the discipline of the school over largely to the pupils themselves, but even to give them considerable initiative and control in reference to their studies and occupations. The second plan addresses itself to a far more systematic organization of the games and recreations of the young. Children, it is thought, may, and should, be taught to play as well as to work, and through this agency the needed supplement to their present social and ethical training is conceived to be obtainable, for it is in the amusements rather than in the work that ethical degeneration is most to be feared and ethical advance most to be hoped for. Hence playgrounds and recreation centers with competent supervision are advocated for the cities. It is urged that the school should become the leading social center for the community, fostering athletic sports, literary, musical, scientific, and social entertainments, and in numberless ways contributing to the healthy interest of children and even of adults in a common life of voluntary yet incalculably beneficial diversion.

Both self-government and play have from time immemorial been to some extent utilized as educational forces in the great English Public schools, and there their value has been convincingly demonstrated. However, it is felt by many English observers that this Public School life with all its excellent features is too much a life by itself, interested too exclusively in its own affairs to constitute the best sort of a preparation for active participation in the social life of the outer world. This defect is one likely to be found in boarding school training everywhere, and it is undoubtedly desirable that the school in developing its own community life should keep in close contact with the family, the economic, the social, and the political interests of the wider public. (See ATHLETICS, EDUCATIONAL; PUBLIC SCHOOLS.)

(4) Of all the present-day advocates of radical changes in regard to provision for moral education, those who believe in direct and regular instruction in morals make up the most distinct and, perhaps, the most numerous group. They may be divided into two classes. First, we have those who hold that a graded course in morals should run through the school, beginning in the primary department. They insist that such work can be made intelligible, interesting, and practically effective, that it need not be mere preaching, nor be dogmatic, nor productive of priggishness. Second, there are many who regard routine teaching of ordinary preceptive morality as, perhaps, unnecessary and a rather dry formalism at best, but who hold that the older children, especially those of high school grade, should take up the rational discussion of concrete ethical issues such as are creating the difficult problems in the life of the day. School instruction in morality is thus made rational rather than dogmatic and should, therefore, be for the most part postponed until ability to reflect becomes prominent in the child.

(5) Finally, we have many who believe that the failure of our schools in teaching morality is due not to the absence of direct moral instruction, but rather to the divorce between instruction and practice that is found to such an extent in school work. A school that constitutes a genuine life, that teaches through the solution of actual problems that confront the school society will, they think, have no need of special agencies to instruct in duty or responsibility or to train in right habits. The moral sense is born in the practical emergencies of life, and by confronting a child with these we may easily develop that sort of feeling, thinking, and acting which belongs to a strong and efficient character. We need not so much to expand the curriculum in order to include morality, as to reorganize it and the method of teaching it so as to make it stand for an inevitable progress of the child into the problems and the ideals of the social life of the time.

E. N. H.

See CHARACTER; ETHICS AND EDUCATION; RELIGIOUS EDUCATION.

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MORAL EDUCATION BOARD. — See MORAL EDUCATION.

MORAL IMBECILITY. — See MORAL INSANITY.

MORAL INSANITY. — This term has been used to indicate an inability on the part of the individual to comport himself in accordance with the legal and moral standards of the community, and is not a disease in itself (although so considered by some English writers). It is a symptom to be found especially in the feeble-minded and in cases of paresis (*q.v.*). The condition is most clearly seen in those individuals who are known as moral imbeciles. These people steal, lie, and perform all kinds of immoral sexual acts to the exclusion of the normal. Such an individual may otherwise be normal mentally, but the moral sense appears to be lacking. The subject is one of considerable importance in dealing with school children, and especially with the so-called delinquent classes.

S. I. F.

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MORAL TRAINING. — See MORAL EDUCATION.

MORALITY AND MORAL SENSE. — Morality in its objective meaning is the body of practices, habits, and beliefs which the prevailing enlightened judgment of a period regards as right, and which accordingly it strives to inculcate by all forms of education and tuition, and which, within certain limits, it strives to enforce against individuals who openly transgress. The various theories of morals or ethics arise partly from the efforts to criticize, purify, and systematize current morality in the objective sense, and partly in the effort to discover its ultimate basis and justification.

Moral sense, in its broader usage, denotes the body of judgments current in a community with respect to morality. It is called a " sense" to express its relatively unreasoned character; our more fundamental moral estimates and ideas have become ingrained in us by education and habit, and hence are identified with our immediate emotional and practical responses rather than with consciously reasoned out conclusions. In its more technical meaning, " moral sense " denotes one variety of the theory about morality which holds that moral judgments are innate or intuitive, not the results of experience. The term " sense " is used to indicate the notion that the direct perception of right and wrong attaches to particular cases, not to general principles. In the case of its leading historic representatives, Shaftesbury and Hutcheson, it also connoted an assimilation of our moral to our æsthetic perception. Just as a man of good taste responds immediately to the beauty or ugliness of objects, so a man of moral sense appreciates at once the loveliness or baseness of character and acts.

J. D.

See ETHICS; INNATE IDEAS; INTUITION; MORAL EDUCATION.

MORAVIAN CHURCH AND EDUCATION. — The history of the Moravian Church falls into two parts, that of the Ancient Unitas Fratrum, extending from 1457 to the beginning of the eighteenth century, and that of the resuscitated church — variously known as the Unity of the Brethren, Bruedergemeine, Herrnhuters, but most commonly called the Moravian Church — reaching from the latter date to the present time. In both periods this church has been deeply interested and energetically engaged in educational work.

At a very early day the Ancient Unitas Fratrum, first established in Bohemia and Moravia and later in Poland, gave attention to popular education. From its famous precursor, John Huss, great reformer, but also the most popular professor of the University of Prague in his day, it had received inspiration to fight ignorance, the fruitful mother of sin and error. Free elementary schools were opened in all the villages where the Unity had parishes. In course of time they ranked among the best of the land. With the aid of friendly nobles, some fifteen higher schools were established at different points in Bohemia and Moravia, the fame of which attracted pupils from beyond the bounds of the church and the country, even sons of the nobility. In these schools the syllabus was much the same as in other schools of corresponding grade. Latin was taught in most, and in some dialectics, rhetoric, physics, astronomy, and geometry. The system of education was largely practical. Chief stress was laid on religious training. Among the textbooks were a catechism, a book of extracts from the Gospels and Epistles, a " Book of Morals," and the hymnbook of the church, the first edition of which appeared in 1501. A college was founded at Eibenschuetz for young noblemen in 1574. Ten years later a theological seminary was established in connection with this institution, and within the succeeding twenty years other divinity schools were opened at Jungbunzlau in Bohemia, Prerau in Moravia, and at Ostrorog in Poland. The ministers of the Unity came to be among the most highly educated of the time. The famous college at Lissa, Poland, over which Comenius presided for some time, was begun in 1624. In Comenius (*q.v.*) all that was best in the educational experience of the Ancient Unitas Fratrum was embodied. Practically all of these schools were wiped out by the terrible anti-reformation of the seventeenth century, which well-nigh crushed the church itself, though not before they had given powerful stimulus to the revival of learning all over Europe.

Largely through the influence and almost prophetic provision of Comenius, the traditions of the Ancient Unitas Fratrum and the means for reconstructing its peculiar system were preserved against a possible resuscitation of the organization. In the event, this was brought about at the beginning of the eighteenth century, in Saxony, under the leadership of Count Zinzendorf. Thus the educational ideals of the Ancient Unitas Fratrum were transmitted under the most favorable auspices. They were, also, invigorated by an infusion of the best elements of the European culture of the time through Zinzendorf, of Halle and Wittenberg, as well as Spangenberg and Boehler of Jena, Pyrlæus of Leipzig, and many other university men who became identified with the Moravians and knew the value of liberal culture. Naturally, almost from the beginning of the Moravian settlement at Herrnhut, Saxony, attention was devoted to education, particularly because many of the Moravians were so occupied with the diversified missionary and evangelistic operations of the church, speedily and widely established, that provision had to be made for their children. Hence, boarding schools as well as day schools were started. By 1750 the church had established in Germany an infant school, two boys' schools and a girls' school, a pædagogium and a theological seminary; in England a boys' school; in America two girls' schools and a boys' school, besides day schools in each of these countries and elementary mission schools in various heathen lands. In them all the Comenian principles ruled. Great emphasis was laid on religious training; Moravian teachers aimed at well-rounded Christian character. Considerable attention was given to handwork, both for boys and girls. The schools came to enjoy a fine reputation for thorough training and strict moral discipline. Much stress was laid on individual attention. In consequence, the schools became widely popular, especially among the cultivated classes, and at an early day they were opened to other than Moravian children. Thus the church came to recognize in this direction an opportunity for widening its mission. Moravian educational theories were formulated by Bishop P. E. Layritz in *Betrachtungen über eine verständige und christliche Erziehung der Kinder* (*Thoughts on a rational and Christian education of Children*, 1776), giving suggestions for education up to twenty-one.

Subsequently, the educational activity of the church was greatly developed. In Germany fourteen day schools, primary and more advanced, are maintained. In addition there are ten boarding schools for girls and six for boys. Recently much interest has been shown in industrial schools carried on for girls from fourteen to seventeen years of age, who are instructed in the womanly arts of handiwork, music, housekeeping, etc. There are fourteen such schools. For the furtherance of all this educational activity a teachers' seminary for men was established in 1872, at Niesky, and one for women, in 1875, at Gnadau. The secular instruction is kept well up to the requirements of the Imperial Department of Instruction. Besides, a college and a theological seminary continue their distinctive work, and a missionary training institute is in operation. In England and Ireland there are five day schools. Two boarding schools for boys and five for girls are maintained, which, as regards secular education, are recognized secondary schools, adapted to the requirements of the University Local Examinations. A theological college has been doing its work since 1860, and a missionary training school was established in recent years.

In America Moravians began their work in 1735, settling first in Georgia and a few years later transferring their operations to Pennsylvania and the neighboring colonies. In 1739 Spangenberg wrote to Count Zinzendorf from Pennsylvania (see Pennsylvania, Education in) that "almost no one made the youth his concern." Naturally, therefore, Moravians in this country included educational effort in their plans. Their special zeal and capacity for the training of the young blossomed out in schools of various kinds, particularly in Pennsylvania, where the provincial authorities, during the first three quarters of the eighteenth century, did next to nothing for the cause of general education. In 1742 Zinzendorf inaugurated a school for girls in Germantown; later this was transferred to Bethlehem, Penn., where it still continues as a seminary and college for women. A school for boys was founded at Nazareth in 1743, but was transferred, two years later, to Frederickstown, where it flourished for some years. Linden Hall Seminary for girls was founded in 1746, and reorganized in 1794, at Lititz, Penn. During the next three years more than a dozen day schools were opened in Pennsylvania and elsewhere, for it was the policy of Moravian leaders to organize schools wherever they established a congregation or posted a preaching station. Unfortunately, these schools ceased when Braddock's defeat opened the floodgates and a turbulent stream of savagery poured into the back country beyond the Blue Mountains. Thus Moravian educational effort was driven back upon itself and confined to the parochial and boarding schools of the settlements. Yet at this critical time a boys' school was opened at Nazareth in 1759. After reorganization in 1785, this has continued to the present time. The Salem Female Academy and the Salem Boys' School, N. C., were established somewhat later. Both are flourishing at the present time, the former under the name and character of the Salem Academy and College for Women. At the present time in America Moravians are operating three boarding schools for girls, two of which are also colleges, one boarding school for boys, and three day or parochial schools. In 1807 a theological seminary was established, and reorganized in 1858 under the name and character of the Moravian College and Theological Seminary.

In subjecting to scrutiny the curricula of these schools in their early days, it should be remembered that textbooks were rare. The accessories of the modern schoolroom were mainly wanting. Nevertheless in some of them special attention was paid to English, French, and German. Mathematics, astronomy, and history find their places beside the more elementary branches. At Nazareth Latin and Greek were read. Instrumental and vocal music and drawing contributed pleasant accomplishments. The Bethlehem spinning, needlework, and embroidery were famous, fitting young women for life. In the boys' school at Lititz opportunity was furnished for learning various trades. Unobtrusively and free from sectarian bias, religion was imparted as a matter of course. Despite defects and crudities, here were the elements of a liberal education. At the present time these schools measure up to the standards of similar schools elsewhere in the land.

In colonial days the Moravians maintained mission schools among the Indians. Wherever it was possible in the Indian country, within and beyond the bounds of the Pennsylvania colony, church and school were established. Wickersham, *History of Education in Pennsylvania*, pays these Moravian mission schools the following tribute: "Even Carlisle and Hampton, with all their merit, have less to recommend them as schools for Indians, than had the old Moravian towns of Gnadenhuetten, Friedenshuetten, and Friedensstadt."

The mission work of the Moravians has been extensive, and has embraced the West Indies, Central and South America, Labrador, Greenland, Alaska, the North American Indians, South Africa, East Central Africa, Australia, and Tibet. In each case educational and evangelistic work went hand in hand, various grades of schools being established in many lands.

The present extent of all Moravian educational work may be summed up thus. The Moravian Church operates 409 schools, employs on their account 1312 teachers, and imparts instruction to 36,101 children and young people either bearing the Moravian name or intrusted by those of other names to its educational institutions. Moravian schools embrace a wide range scholastically, from humble elementary schools to technical institutions of recognized worth. There are kindergarten and primary schools, parochial day and boarding schools, industrial, teacher training and missionary training schools, colleges, university affiliations, and theological seminaries. True to their international character, Moravian schools, of one or another of these types, are doing their work on every continent, in many lands, among diverse peoples, and through various tongues. W. N. S.

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MORAVIAN COLLEGE AND THEOLOGICAL SEMINARY, BETHLEHEM, PA. — The theological seminary was established in 1807 at Nazareth, Pa., and removed to Bethlehem in 1837, when a regular college course was established. After an interval at Nazareth, the institution was permanently established at Bethlehem in 1858 and incorporated under the present title in 1863. The college offers classical, Latin scientific, and general scientific courses leading to the A.B. and B.S. degrees. The seminary confers the B.D. after a two years' course preceded by classical studies. The enrollment in 1911–1912 was sixty-seven and the faculty numbers six members.

MORBID. — Used particularly in speaking of ideas; is the equivalent of abnormal (*q.v.*). Morbid states may be temporary or persistent, but in either case do not necessarily denote a condition of insanity. S. I. F.

MORBID PSYCHOLOGY. — See Psychology, Pathological.

MORBIDITY IN SCHOOL CHILDREN. — This term is used to indicate the disease rate, usually estimated in percentage for school children. Many extensive investigations in different countries have now been made. In 1881 Hertel published the results of his classic study of over 4000 school children in the higher schools of Copenhagen. The result showed that 31.1 per cent of the boys and 39.4 per cent of the girls were suffering from chronic diseases, not including defects of sight and hearing. This investigation was followed in 1882 by the appointment of commissions both in Denmark and Sweden to study the subject. The Danish Commission reported on the health of 17,595 boys and 11,646 girls. Of the total number of boys 29 per cent were found ill, of the girls 41 per cent. The report of the Swedish Commission concerned the health of some 18,000 pupils of the higher schools. Axel Key who prepared the report for this Commission gave for the largest group the following statistics. Of 11,210 pupils of the higher boys' schools, 48.8 per cent were afflicted with chronic disease, the largest percentage of illness being found on the classic side. Of 3072 pupils in the higher girls' schools the percentage of illness was 61.7 per cent. These investigations in Scandinavian schools raised grave questions in regard to the conditions of school life in general. How far the school was responsible was not evident, but it seemed clear that the conditions of school life together with home study and an inadequate supply of sleep were in large part responsible.

Since these earlier studies many investigations of the health of school children have been made in Europe and in this country. While the percentage of illness is not as great usually as found by the Danish and Swedish Commissions, it appears that everywhere there are a large number of children suffering from chronic disease. And if we add to this the number that suffer from contagious diseases, and from the various defects of sight, hearing, etc., the number of children that need special hygienic care is likely to be large in any school class.

Many investigations in different cities of this country have shown a large percentage of the school children with chronic disease or physical defects. While it is impossible to generalize from the statistics at hand, it is a conservative estimate that 25 per cent of the children in any school are likely to be handicapped by illness or defect of some kind. On the basis of the investigation of 275,641 children examined in New York City in the years 1905 to 1908, of which 71.9 per cent were found to have diseases or defects, Mr. Wm. H. Allen estimated that the number of school children in the United States needing attention would be over 14,000,000. It is to be understood, however, that these large percentages are due to the inclusion of defects in sight and hearing and diseases of the teeth. While in other parts of the country the percentage of disease may not be as great, it is probably true that if the above-mentioned defects are included, this estimate would not be too large. Public alarm or ridicule, however, is often based on a misapprehension of the condition just noted.

These children are in every school; their presence cannot be ignored; they make up in large degree the army of laggards; they are apt to be the cases that require discipline, and the cause of most of the absence from school; they make the task of the teacher difficult, and special hygienic care and medical inspection are necessary. W. H. B.

See MEDICAL INSPECTION.

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MORE, HANNAH (1745–1833). — English author and philanthropist, born at Stapleton, near Bristol, the daughter of a schoolmaster. She showed a ready ability and keen intellect, and studied Latin, modern languages, history, and mathematics. Although she began writing early, her first serious work was a pastoral drama, *The Search after Happiness* (1762), to be acted by the children at her sisters' school. From this time on she devoted herself with remarkable success to a literary career, and in London made the acquaintance of the leaders in the world of literature, being a favorite with Johnson and Garrick, who produced some of her plays. The death of Garrick (1779) marked a change in her career, and she devoted herself almost entirely to devotional and religious literature. In 1785 she settled in the Cheddar district, at that time notoriously vicious and neglected. Influenced by Wilberforce, Hannah More and her sisters devoted themselves to uplifting and improving the population for ten miles around their home at Cowslip Green. The girls were employed at spinning and weaving; with the boys they were taught the Catechism, Psalms, and the Bible. A Bible class was held for adults. The Mores trained teachers for this work, and Hannah wrote some books. Anxious, however, as Miss More was for the uplift of her neighbors, she considered that reading was a sufficient accomplishment for laborers' children;

but farmers' children might for an extra fee learn writing and arithmetic. Another phase of Miss More's activity was her work against the Jacobin influences of the time and the writings of men like Tom Paine. Of this type was her *Village Politics, by Will Chip*, 1793. In 1794 she commenced the issue of *Cheap Repository Tracts*, consisting of stories for the poor pointing the morals of contentment and loyalty. These appeared three times a month, and were continued until 1797. The circulation in the first year is said to have been over two million copies. In 1818 she published *Moral Sketches of prevailing Opinions of Manners foreign and domestic, with Reflections on Prayer*. In 1799 appeared her *Strictures on the Modern System of Female Education, with a View of the Principles of Conduct prevalent among Women of Rank and Fashion* (1799), in which she criticizes the prevailing demand for external accomplishments and a multitude of knowledge without any depth. Religion, she maintained, should be the most prominent part of education, for " we have to educate not only rational, but accountable beings." At the same time the education of women should tend to make them fit companions and helpmates for men, and " the chief end to be proposed in cultivating the understandings of women is to qualify them for the practical purposes of life." Miss More also wrote *Hints towards forming the Character of a Young Princess* (1805), a book of advice on the education of Princess Charlotte, by some thought to have been written at the request of Queen Charlotte.

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MORE, SIR THOMAS (1478–1535). — English statesman and author, born in London, the son of a barrister. He attended St. Anthony's School in Threadneedle Street, where also were Colet and Latimer. On leaving school he was placed in the household of Cardinal Morton, Archbishop of Canterbury, who recognized the boy's ability and had him sent to Oxford (1492). More was entered at Canterbury Hall, which was later incorporated with Christ Church. Here he met Linacre and Grocyn (*qq.v.*), and from the former learned Greek. He had broad interests, and besides his ability in Latin and Greek, he had a knowledge of French, history, mathematics, and music. In 1494 his father, fearing for his religious opinions, withdrew him from Oxford and entered him at New Inn, and later at Lincoln's Inn. In 1497 More met Erasmus (*q.v.*), and the two became firm friends; and it is probable that through Erasmus' influence More continued his scholarly pursuits. For a time More had thoughts of retiring into clerical life, but setting them aside he devoted himself to law with great success. In 1504 he entered Parliament; in 1515 he was sent on a mission to the Low Countries, and there he met many humanist scholars, chief among them Peter Giles, and began what was later published as the second part of the *Utopia;* in 1521 he was knighted, and, enjoying the favor of Wolsey, he was made speaker of the House in 1523; in 1529 he was created Lord Chancellor, retiring into private life in 1532. He joined Henry VIII in his early attack on Luther; but while the King broke away from the Catholic Church, More remained a stanch member; and this, combined with his opposition to the King's marriage to Anne Boleyn, brought him to the scaffold in 1535.

More was a keen man with a strong sense of humor; devoted to the Church, he was not blind to the defects of many of its ministers; with his piety he combined a great love of the liberal studies, to which he added a love of music and art. As an author he composed many poems in Latin and English; in prose his chief works were written in vigorous language, if clumsy in construction, in defense of Papacy against the reformers at home and abroad. His best known work is the *Utopia*, written in Latin and published in 1516 at Louvain, and frequently republished at other places. The earliest English translation was made in 1551 by Raphe Robinson, and has been reprinted by the Oxford University Press. The *Utopia* (Οὐ τόπος) is a description of an ideal country free from the abuses of the Old World. While More does not pretend to give an exposition of the ideal system of education, there is sufficient indication of his views on the subject. " Of all the pleasures," he says, " they esteem those to be most valuable that lie in the mind, the chief of which arises out of true virtue. . . ." Higher education is only for those who have the ability and inclination; for these education is compulsory, and incompetence is punished by relegation to the class of laborers, the vacancy being filled from below. The studies are carried on in the vernacular, and include music, logic, arithmetic, geometry, and astronomy; while they show a ready ability in learning Greek. Strangely enough, More makes no reference to Latin. For the majority lecture halls are open daily, and they study according to their taste and the demands of their occupations. Moral education of children and youths is cared for by selected priests, who with the adults influence by force of example rather than by compulsion of rules. Importance is attached to physical exercise, which includes agricultural labor and handwork, riding and military exercises, sufficient sleep and moderation in eating and drinking. It must be said, however, that More, unlike other authors of ideal commonwealths, does not lay so much stress on a thoroughgoing system of education as might be expected. In his family life More paid considerable attention to the education of his children, three daughters and a son, for whom he kept tutors. On the education of women he held that both sexes should be educated alike, for " I do not see why learning . . . may not equally agree with both sexes," for the " true and solid fruits of learning " are primarily the virtues. If women are by nature mentally less able than men, then the aim of instruction must be to remedy the defect. Among the studies which, according to his letters, his children pursued were astronomy, Latin, declamation, composition of verses, exercises in logic, and philosophy. His favorite daughter, Margaret, wrote Latin with such force and purity of style that More's friends could not but believe that it was written by a man.

See further UTOPIAS IN EDUCATION.

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MORNING EXERCISE. — See OPENING EXERCISE.

MORNINGSIDE COLLEGE, SIOUX CITY, IA. — A coeducational institution, maintaining academic, collegiate, music, education, and summer school departments. The entrance requirements are fifteen units. The A.B. degree is conferred on students who complete certain courses which are arranged in five groups. The enrollment in the college proper was 283 in 1911-1912. The faculty consists of thirty-eight members.

MORPHOLOGY. — See BOTANY.

MORRICE, THOMAS (fl. 1619). — The writer of a pedagogical booklet, entitled *An Apology for Schoolmasters, Tending to the Advancement of Learning, and to the Virtuous Education of Children,* 1619. Morrice insists on the dignity of schoolmasters' work. Teachers must not make the profession of the liberal sciences servile. The schoolmaster is in the same case with the professors of divinity, law, physic. He must be learned, of ready utterance, and perfect pronunciation of speech. As to the subjects of instruction, first is " pure and perfect English, to be delivered with decent action and gesture, with a right accent and distinct pronunciation "; next " pure and perfect Latin," and " perhaps " Greek. In any case it is the teacher's business to study the child's nature and disposition, and to frame instructions and precepts thereunto, according to the child's capacity. Sports are to be introduced for recreation, and moderate exercise for health of the body. He particularly emphasizes the visualizing value of traveling for the youth. F. W.

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MORRILL ACT. — See AGRICULTURAL EDUCATION; NATIONAL GOVERNMENT AND EDUCATION; TECHNICAL EDUCATION.

MORRILL LAND GRANT. — See AGRICULTURAL EDUCATION; NATIONAL GOVERNMENT AND EDUCATION; TECHNICAL EDUCATION.

MORRIS BROWN COLLEGE, ATLANTA, GA. — A coeducational institution for colored students, founded in 1881 under the African Methodist Episcopal Church, and opened in 1885. Grammar, preparatory, collegiate, normal, musical, theological, commercial and industrial departments are maintained. Degrees are conferred. The enrollment in 1911-1912 was 851 in all departments.

MORRISVILLE COLLEGE, MORRISVILLE, MO. — A coeducational institution chartered in 1872 under the control of the Methodist Episcopal Church, South. Academic, collegiate, music, and expression departments are maintained. The entrance requirements are equivalent to twelve points of high school work. The A.B., Pd.B., and A.M. degrees are granted.

MORSE, JEDEDIAH (1761-1826). — Author of the first American schoolbooks on geography. He studied at the Woodstock Academy, and was graduated at Yale College in 1783. He taught school for a few years, and was one year a tutor at Yale. Engaging in the work of the ministry, he was pastor for thirty years of the First Congregational Church at Charlestown, Mass. He was active in the formation of the Society for the Propagation of the Gospel (1792), and he was the founder of the Association for the Reformation of Morals. But his most abiding labor was in the line of authorship of schoolbooks on geography. His *Geography Made Easy,* published in 1784, was the first American schoolbook on the subject. This was followed in 1789 by his *American Geography, or a View of the Present Situation of the United States.* In 1797 he published his *Elements of Geography,* and in 1814 his *Universal Geography.* For more than thirty years these were almost the sole textbooks on the subject used in American schools; and with the introduction of the study in colleges (Harvard, 1816) they also

found a place in American colleges. In connection with his son, Richard C., Mr. Morse published in 1823 a comprehensive *Universal Gazetteer*. He died at New Haven on June 9, 1826. His son, Sidney Edwards Morse (1794–1871), also attained some distinction as an author of school books on geography. Sidney was graduated from Yale College in 1811, and later studied for the ministry. He published several textbooks on geography, and invented a new system of printing maps in colors. With his brother Richard he established the *New York Observer* in 1823, which he continued to edit until 1858.
W. S. M.

See GEOGRAPHY.

MORTALITY, RATE OF, AMONG CHILDREN. — In vital statistics, the rate of mortality, or death rate, is determined by comparison of the number living and the number dying at each age of life for a given area of country. Reliable statistics are obtainable only for certain restricted regions in the United States, owing particularly to the laxity of regulations governing the registration of births. The table reported here was prepared by the Secretary of the State Board of Health of Massachusetts for the years 1893–1897, and may be considered reliable for the region concerned and fairly typical of the conditions prevailing over the greater portion of this country.

DEATH RATE, PER 100, FOR BOYS AND GIRLS IN MASSACHUSETTS

YEAR	1	2	3	4	5	6	7	8	9	10
Boys . . .	17.23	4.22	2.00	1.40	1.08	0.81	0.65	0.54	0.45	0.39
Girls . . .	14.70	4.00	1.92	1.40	1.00	0.83	0.66	0.55	0.46	0.49

YEAR	11	12	13	14	15	16	17	18	19	20
Boys . . .	0.33	0.29	0.28	0.30	0.36	0.43	0.49	0.53	0.58	0.62
Girls . . .	0.35	0.31	0.31	0.34	0.40	0.47	0.54	0.58	0.61	0.65

Inspection of this table suggests the following inferences: (1) For both sexes the first year of life has by far the highest mortality. (2) Male children under three have uniformly a higher death rate than female children of the same age. (3) During the years five to twenty-one, inclusive, the female death rate is slightly higher than the male. (4) The year of minimal mortality is the twelfth for girls and the thirteenth for boys, or the year just at the dawn of puberty in each sex. (5) There is no evidence that attendance at school affects the death rate either favorably or unfavorably.

E. M. Hartwell's report, in 1894, on the mortality of children in the city of Boston alone, which was based on data for the census years 1875, 1885, and 1890 shows, for each age, a higher death rate than that given above for Massachusetts as a whole. Hartwell found the year of minimal mortality in Boston to be the thirteenth for boys (0.34 per cent) and the twelfth for girls (0.32 per cent). Both distributions, however, concur in showing that "the period 10–15 is the half-decade in all human life in which fewest deaths occur to a thousand living," and that the minimal year is earlier for girls than for boys. It will be noted that the maximal resistance to fatal disease coincides with the maximal rate of growth in height and weight. G. M. W.

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MOSCOW, UNIVERSITY OF. — See RUSSIA, EDUCATION IN.

MOSELLANUS, PETER (1493–1524). — Humanist scholar, so called from the position of his native town, Bruttig, or Proteg, on the River Moselle. He became a student in the University of Cologne in 1509, and studied under the humanist Hermann von dem Busche, was fellow pupil with Erasmus at Deventer, and learned Greek from Johannes Cæsarius. He then studied at Freiburg and in 1515 went to Leipzig, and in 1517 he succeeded Richard Croke, the successor of Erasmus, as Reader of Greek at Cambridge. Mosellanus gave a notable inaugural address *de variarum linguarum cognitione*. Greek was still a "suspect" subject, and this, with his advocacy of the introduction of Hebrew gave color, at that time, to a twofold charge of "heresy" from ecclesiastics. Of frail body, enfeebled by sickness and privation, he bore himself bravely, a martyr to the humanities, and in a celebrated address given in 1528 won the audience of students as against his critics. In the year of his appointment, 1517, he was able to publish his collection of Latin Colloquies, which he called *Pædologia*, as to which he received a letter of congratulation from the great Erasmus. Forty-five editions of this work appeared by 1550, one of these in England, 1532, by Wynkyn de Worde. These dialogues graphically disclose the state of life in Leipzig University, as the *Manuale Scholarium* of 1480 had described the Heidelberg students. (See STUDENT LIFE.) Lily's *Latin Grammar* borrowed the plan of the verbal figures from Mosellanus, though with alterations. Malim's *Consuetudines* (1561) for Eton include the study of the Mosellan figures by Forms VI and VII.

Mosellanus died in 1524, at the age of thirty-one years. In 1528 in the *Ciceronianus* he received the high praise of Erasmus: "There is nothing great which might not have been expected from him, had not a premature death snatched him from our midst in youth, scarcely entered into the arena of glory, to the great grief of all the learned and the no small loss of learning." F. W.

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MOTHER GOOSE. — See Nursery Rhymes; Literature, Children's.

MOTHER PLAYS. — See Froebel; Kindergarten; Infant Education.

MOTHERHOOD, EDUCATION FOR. — See Parenthood, Education for.

MOTHERS' CLASSES AND MEETINGS. — See Parents' Meetings.

MOTIVE. — That phase of a volitional process which precedes in consciousness the decision or choice. Thus the motive for going to have a tooth pulled may be the pain which it causes. The motive for not having it pulled may be the thought of disfigurement. The motive has sometimes been treated as essentially an intellectual or cognitive process. Wundt recognizes, on the other hand, two aspects in every motive, an affective or feeling component, which he calls the impelling feeling, and the ideational element, which he calls the moving reason. Thus he says, "When a beast of prey seizes his victim, the moving reason is the sight of the victim, the impelling feeling may be either the unpleasant feeling of hunger or the race-hate aroused by the sight." (*Outlines of Psychology,* § 14, 4.) It may be pointed out that even when there is an impelling feeling included in a motive, the feeling must be consciously recognized as a part of the situation before it can serve to determine the volition. It need not, however, be reduced to a cognitive process through this conscious recognition.

The educator is interested in the question of motivation of action from two points of view. First, in practical procedure the teacher must ask how can adequate motives be found to stir up activity of the right sort? Secondly, the teacher is concerned with the subsequent effects of the employment of motives. Thus the hope of reward or the fear of punishment may be practically effective, but may so sap the independence of the pupil as to render him incapable of intelligent self-guidance in later life. The problem of motives is especially important in school life, since the school environment is in a high degree artificial, and genuine motives are difficult to provide.

In connection with the training of the will, it is to be pointed out that the cultivation of clear, broad insight is the surest guarantee of correct behavior. In terms of the analysis of motive suggested in the above paragraph, this means the cultivation of clear intellectual insight into the needs of individual and social life as ground for action. C. H. J.

See Interest.

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MOTOR ABILITY. — See Motor Education; Motor Instincts, etc.

MOTOR CONTROL. — See Habits.

MOTOR DEFECTS. — See Movement Disorders.

MOTOR EDUCATION. — See Activity; also Motor Processes.

MOTOR INSTINCTS. — See Instincts.

MOTOR PROCESSES. — The nervous system may be roughly divided into sensory and motor regions. The sensory regions are those which receive stimulations from the external world, and the motor regions are those which send out impulses to the muscles of the body. The relation of sensory processes to consciousness has always been fully recognized. Color and sound and the other sensations are all readily recognized as sources of conscious experience. The discussion of sensation has therefore always been an important chapter in any treatment of the relation between mind and body. On the other hand, the relation between the motor processes in the nervous system and conscious experience is much more complicated and obscure. Certain motor processes, such as those of reaching out the hand to grasp a desired object, are obviously related to the conscious processes of choice and volition. But it very early became apparent to students of human behavior that many of the contractions of the muscles are in no wise to be treated as voluntary processes. The contractions involved in respiration, in many of the instinctive activities, and in most of the emotional expressions are not matters of voluntary choice. There is, nevertheless, a traceable connection between all of these muscular activities and the general state of consciousness, even where volition is not involved. This is conspicuously true of the emotional reactions. These reactions have their conscious parallels in very pronounced states of feeling. Not only is feeling related to the muscular activities, but it has become obvious during the more complete analysis of the perceptual processes that here also the muscular activities are of importance: thus in describing the methods which we follow in visual perception, some place must be given to the movements. Berkeley, Helmholtz, Wundt, and others have laid great emphasis upon eye movements as factors in the development of visual space perception. Here again consciousness is not of the volitional type, but rather of the perceptual type. Any defect in the movements of the eye will reflect itself in the change in the form of visual knowledge.

So fully has the importance of motor processes come to be recognized in recent psychological discussions, that a number of theories have been propounded to explain their place in the general economy of mental life. In a paper in the *Psychological Review* of 1896 Dewey criticizes that doctrine of the conditions of mental life which distinguished sharply between the motor processes and the sensory processes. He holds that both of these processes are involved as necessary conditions of every state of consciousness, and that both contribute equally to the completed conscious activity. This may be made clear by quoting briefly one of his illustrations: " Take the withdrawal of the hand from the candle flame for example. What we have is a certain visual-heat-pain-muscular-quale, transformed to another visual-touch-muscular-quale." That is, the reaction is just as essential to the complete recognition of the object as is the visual experience.

The tendency to emphasize motor processes as equally significant with sensory processes appears also in the writings of MacDougall in a series of articles in *Mind* for 1898. MacDougall points out that consciousness is present only where muscular and nervous processes are being organized into new forms of behavior. That is, consciousness would disappear entirely, if the nervous system were not involved in working out certain new connections.

A third theory is that set forth by Münsterberg in his "action theory." Münsterberg holds that the motor processes in the nervous system condition the vividness and value of all experiences. The more open the motor channels, the greater the vividness of the experience; thus when one is ready to act instantly upon the reception of a stimulus, the experience will be much more vivid than when he is unprepared for action. The term "value" as used by Münsterberg differs very little from the general term " emotional tone." If the stimulus is discharged into certain sets of muscles, the emotional tone is pleasurable; if discharged in other directions, it takes on a different character.

An older doctrine with regard to the motor processes was that defended in his earlier writings by Wundt, and known under the name of " innervation theory." According to this theory, the outgoing motor processes, as they leave the cerebrum, are conditions for certain phases of experience which are coordinate in importance with the conscious elements aroused by incoming sensory processes.

To the untechnical student of mental development the emphasis which psychologists lay upon the motor processes seems somewhat extravagant. One reads with great reserve the statement that a very large part of mental life is drawn from muscle sensations or joint sensations. The technical student of mental processes, on the other hand, finds himself constantly driven to the recognition of the fact that sensory qualities are bound together in space percepts through movement, and that the whole end of conscious activity is to be sought in some form of behavior. Many students of psychology are prepared to use the word " behavior " as the most important general word in their psychological vocabularies. The sensory stimulus is significant merely because it sets going some organized train of behavior. The psychology of habit, in addition to the other topics above mentioned, immediately suggests itself as an important part of this general discussion.

To the teacher the recent discussion of motor processes is significant because it draws attention to the fact that activity of some type is essential to all educational development. There is no such thing, as William James points out in his *Talks to Teachers,* as " sensation without behavior" (page 26). " No truth however abstract is ever perceived that will not probably at some time influence our earthly action. You must remember that when I talk of action here I mean action in the widest sense. I mean speech, I mean writing, I mean yesses and noes, tendencies 'from' things, and tendencies 'toward' things; and I mean them in the future as well as in the immediate present." James further summarizes his psychological view of education by defining education as training in behavior.

All of the recent movements toward the introduction of constructive work into the school emphasize the practical importance of muscular activity for education. So enthusiastic have some defenders of activity been in their advocacy of this type of school work that they have criticized the older forms of education as entirely devoid of motor processes. Students of education should recognize the falsity of the criticism in view of the fact that speech is a form of motor process as well as is manual work. Furthermore, some of the recent advocates of constructive work have stated that unless children are given something to do in the schools their motor organism is likely to atrophy. We are told that the motor areas of the cerebrum will suffer if not properly exercised by school practice. Here again attention should be turned to the fact that some kind of motor process will always follow upon the stimulation of the nervous system. There will be inner organic movements if no other. The major need of the school is not activity on the ground that it was entirely absent in the earlier forms of education, but rather the selection of those forms of motor activity which are most likely to develop the individual. If manual training is a more satisfactory form of activity in order to produce certain types of perceptual recognition, it should be introduced, not because it is a form of motor process merely, but because it is a better form of motor process than verbal reaction for the purpose in hand. There may be certain cases in which verbal reaction is very much more economical and advantageous. In this case the verbal reaction will draw the attention of the learner to certain distinctions that could not be clearly marked in any constructive activity.

All forms of behavior, therefore, should be considered in any complete psychological discussion of education. Indeed, it is probable that the motor processes will receive increasing attention in future psychological analysis of children's consciousness and development. That expression as well as impression is important to the teacher is demonstrated beyond the possibility of any doubt, and the study in detail of the different forms of expression remains as one of the major lines for future educational investigation. C. H. J.

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MOUNT ALLISON COLLEGE UNIVERSITY, SACKVILLE, N.B. — Established in 1858 as Mount Allison Wesleyan College, the present title being adopted in 1886. The institution is owned by the General Conference of the Methodist Church of Canada. The following courses are given: arts leading to A.B.; divinity leading to B.D.; engineering leading to entrance on the third year of Applied Science at McGill University; and honor courses in classics, mathematics, science, philosophy, and English language and literature. The institution is coeducational, and is affiliated with McGill University. The faculty consists of eighteen members, and the student body 250 in 1912.

MOUNT ANGEL COLLEGE AND SEMINARY, MOUNT ANGEL, ORE. — An institution founded in 1887 and conducted by the Benedictine Fathers. Preparatory, commercial, academic, and collegiate departments are maintained. Degrees are conferred in arts, letters, science, and music. The enrollment in 1911–1912 was 175.

MOUNT HOLYOKE COLLEGE, SOUTH HADLEY, MASS. — An institution for the higher education of women chartered in 1836 and opened in 1837 as Mount Holyoke Seminary through the efforts of Mary Lyon (*q.v.*), who was president from 1837 to 1849. In 1888 the institution was chartered as Mount Holyoke Seminary and College, and in 1893 obtained the present title. The entrance requirements are fifteen units; students are admitted by certificate or examination. The A.B. degree is conferred on completion of a course of two years of prescribed and two of elective work. The enrollment in 1911–1912 was 771. The staff consists of 115 members.

See Lyon, Mary; Women, Higher Education of.

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MOUNT SAINT AGNES COLLEGE, MOUNT WASHINGTON, MD. — A Catholic educational institution founded in 1867 and chartered as a college in 1890. A high school and schools of art and music are maintained in addition to the college department. Requirements for admission are the completion of a classical high school course. The A.B. degree is conferred by the institution.

MOUNT SAINT JOSEPH'S COLLEGE, BALTIMORE, MD. — An institution incorporated in 1876 and conducted by the Xavierian Brothers. Commercial, classical, scientific, and normal courses are given. Students are admitted to the college department on completion of a high school course. The college confers the A.B., B.S., and A.M. on completion of the appropriate courses. The enrollment in 1910–1911 was 169.

MOUNT ST. JOSEPH COLLEGE, DUBUQUE, IA. — An institution for the higher education of women, founded and maintained by the Sisters of Charity of the Blessed Virgin Mary. College, academic, commercial, preparatory, music and art departments are maintained. The entrance requirements are twelve units. The A.B. and B.S. degrees are conferred. The enrollment in 1908–1909 was 221.

MOUNT ST. MARY'S COLLEGE, EMMITSBURG, MD. — A Catholic college with a secondary school department founded in

1808 and conducted by secular clergy. A four years' course leads to the A.B. degree, and the A.M. is also conferred. An ecclesiastical seminary is also attached to the college. The enrollment in 1910–1911 was 357. The teaching staff consists of eighteen members.

MOUNT UNION COLLEGE, ALLIANCE, OHIO.—A coeducational institution established in 1846 as Mount Union Seminary, and chartered as a college in 1857. An academy, college, and conservatory of music are maintained. The entrance requirements are fifteen units. Classical and scientific courses are offered leading to the A.B. and B.S. degrees. There was in 1911–1912 an enrollment of 183 students in the college proper.

MOUNT VERNON COLLEGE, MOUNT VERNON, OHIO.— A coeducational institution maintained since 1905 by the Seventh Day Adventists with college, normal, industrial, commercial, academic, music, and nursing departments. Four years of high school work are required for entrance; courses are given leading to the A.B. and B.S. degrees. The enrollment in 1911–1912 was 162. The teaching staff consists of nineteen members.

MOVEMENT DISORDERS. — These are very varied and limit the ability of the individual to properly react through stimuli. They may be grouped as: (*a*) slowings (see RETARDATION); (*b*) lessened power (*e.g.* paresis (*q.v.*), paralysis (*q.v.*), monoplegia, hemiplegia, paraplegia, diplegia, rigidities, and contractures); and (*c*) increased motility (*e.g.* tremor (*q.v.*), spasm (*q.v.*), tic (*q.v.*), and convulsion (*q.v.*)); see also APHASIA; ATAXIA; CHOREA; EPILEPSY; INTOXICATION; KATATONIA; PAROXYSM; SPEECH DEFECTS; STAMMERING; STUPOR; VERTIGO. S. I. F.

MOVING PICTURES AS MEANS OF INSTRUCTION. — See VISUAL AIDS TO TEACHING.

MOVING SCHOOL. — The moving school was the first and the most distinctive step in the evolution of the district school (*q.v.*). The original town school of New England had been located in the village during the entire year and was taught (except in the largest towns) by a single teacher. The moving school was this school of one teacher located in various parts of the town during successive periods of the school year. It was most prevalent during the first half of the eighteenth century. The more remote conditions leading to its creation were: (1) social disintegration, (2) dispersion of population, (3) decentralization of local institutions due to growth of democracy, (4) example furnished by the scattered private master and dame schools, (5) renewed interest in education, which brought about the passage of laws imposing heavier fines upon towns for failure to maintain schools (in 1701 and 1718) and which secured, also, a rigid enforcement of such laws. The immediate reason for its establishment was the abolition of the tuition tax and the raising of the entire support of the school by the town rate. Many of the inhabitants throughout the town kept their children at home rather than pay the town tax; experience proved the impossibility of raising the master's salary by the combined town rate and tuition tax. On the other hand it cost little or no more to maintain a school by town rate than to pay a fine by town rate. At this juncture the people in the outer sections would not vote the town rate for a school unless they enjoyed its benefits equally with the inhabitants of the village. Thus the village was compelled to yield and the moving of the town school into the various outer sections resulted.

The next step in the evolution of the school district was the divided school (*q.v.*). H. U.

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MUHLENBERG COLLEGE, ALLENTOWN, PA. — Formerly Allentown Academy, incorporated under the present title in 1867 and now under the control of the Evangelical Lutheran Ministerium. Academic and collegiate departments are maintained. The entrance requirements are fourteen units. The A.B., B.S., and Ph.B are conferred on completing the appropriate courses. The total enrollment in 1910–1911 was 278. The teaching staff consists of thirteen members.

MULCASTER, RICHARD (*c.* 1532–1611). — English schoolmaster and educational writer, born at Brakenhill Castle of a border family. He was educated at Eton under Nicholas Udall (*q.v.*) and in 1548 was at Cambridge as a King's scholar. In 1555, however, he is found at Christ Church, Oxford, where he graduated in 1556. He was appointed the first headmaster of Merchant Taylors' School (*q.v.*) and taught there successfully for twenty-five years. In addition to Latin, Greek, and Hebrew he devoted attention to vocal and instrumental music and drama. In 1573–1574 and 1575–1576 he presented plays before Elizabeth, who later appointed him rector of Stanford Rivers in Essex. Owing to a dispute with the governors of the school, he resigned in 1586, but again appeared at the school in 1588 as an examiner. (See EXAMINATIONS.) For several years he seems to have attended to his clerical duties, but in 1596 he was appointed headmaster of St. Paul's School, where he remained until 1608. He died in straitened circumstances in 1611. Whatever Mulcaster's claim to reputation as a teacher may have been, he will always have a place in the history of English education as the author of two works full of ideas and suggestions which were some three centuries in advance of his time. Unfortunately his style of writing was not one to. command attention and although his works possess a richer educational content than those of his contemporaries, Ascham and Elyot, they remained neglected until they were restored by the revival of educational interest in the last century. In 1581 appeared *Positions wherein those Primitive Circumstances be examined, which are necessarie for the Training up of Children, either for skill in their Books or Health in their Bodie.* The work is dedicated to Queen Elizabeth. The *Positions* are the fundamental principles for an efficient system of education. The author gives his reasons for writing the treatise in English: those who know Latin will find just as much ease in understanding English, and generally that language is better understood which is used from childhood, "as our first impression is alwaie in English before we do deliver it in Latin. And in persuading a known good by an unknown waie are we not to call unto us all the helpes that we can, to be thoroughly understood?" Mulcaster begins with the earliest education of the child, whose individuality must be respected by teacher and parents. All classes of society are to attend the elementary school where reading, writing, drawing, and music are taught; the vernacular is always to precede a foreign language. Mulcaster is probably the earliest advocate of drawing "by penne or pencil, . . . verie requisite to make a man able to judge what that is which he byeth of artificers and craftsmen, for substance, forme and fashion, durable and handsome or no; and such other necessarie services, besides the delitefull and pleasant." In the teaching of music (singing) he emphasizes the value of proper breathing. A great part of the work is devoted to the value and character of physical training, for Mulcaster insists on the *mens sana in corpore sano*. This part of the treatise is based very probably on the *De Arte gymnastica* of Girolamo Mercuriale (1530–1606). Mulcaster not only gives a large number of exercises and games to train all parts of the body, but he suggests the proper seasons of the year and the time of day for the various exercises. In dealing with school buildings he emphasizes the importance of air, light, and playgrounds. The elementary school should be compulsory for all, rich and poor, boys and girls. Not all can be scholars or learned in the classics, but all should have the elements, and in higher education greater differentiation of courses is desirable. On the education of girls and women he takes up a very progressive position; he argues as follows: "Our countrey doth allow it, our duetie doth enforce it, their aptnesse calls for it, their excellencie commandes it: and dare private conceit once seem to withstand, where so great and so rare circumstances do so earnestly commende." But handwork for girls is not to be neglected. On the question of private tutorial education as opposed to public he ranges himself strongly on the side of the latter and overthrows all the traditional arguments in favor of private tuition. So, too, he is at one with Ascham in opposing the prevailing system of foreign travel. But it is on the question of teachers that Mulcaster becomes almost prophetic. Setting up high standards for the teacher (professional spirit, all-round knowledge, and discretion), he insists as strongly on their proper training. He recommends the establishment of training colleges at the universities parallel to other professional schools for divines, physicians, and lawyers, — an ideal only just beginning to be realized.

In 1582 appeared *The First Part of the Elementarie* which deals with the correct use of written and spoken English. This is one of the earliest as well as one of the strongest pleas for the cultivation of the vernacular. Mulcaster is opposed to the bondage to Latin. "I love Rome," he says, "but London better; I favor Italy, but England more; I know the Latin, but worship the English." He discusses the origin of language, orthography, and language reforms, and gives rules for orthography and composition. A *Second Part* was apparently contemplated, but never appeared. Mulcaster also wrote verses in Latin and English, indifferently in both, and was the author of a *Cato Christianus*. Much was done by Quick (*q.v.*) in drawing attention to the original and suggestive works of the practical schoolmaster who ruled over the two greatest London schools of his day.

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MULLANY, PATRICK JOHN (BROTHER AZARIAS) (1847–1893). — Educator of the order of Christian Brothers. He was educated in the colleges of his order in America and subsequently studied in England and France. He was president of Rock Hill College (1879–1886) and professor in De La Salle Institute in New York (1889–1893). He was one of the founders of the Catholic Summer School at Plattsburgh, N.Y., and wrote numerous papers on education and philosophy, as well as books on the philosophy of history, literature, and the relation of Aristotle to the Christian church. W. S. M.

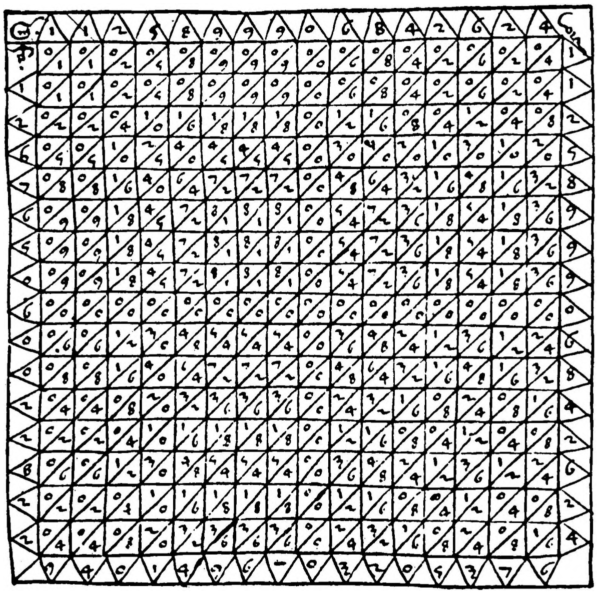
MULTIPLICATION. — In its primitive form, the operation of taking one number as many times as there are units in another, or of folding a number on itself many times, from *multus* (many) and *plicare* (to fold). The word is related to the English *manifold*, and it appears in various languages with a similar kind of translation. Thus it is found in the early printed books of Germany in the form of *mannigfalten* and *vervielfachen*, as well as *Mehrung*.

The idea of "leading" a number into this manifoldedness is seen in such Latin expressions as this from Jordanus (1496 edition of his arithmetic): "Si aliquis numerus . . . ducatur." Clichtoveus (1503 edition) says: "Multiplicare, est ex ductu vnius numeri in alterum producere," and similar expressions are found in most Latin works. This is the origin of our common expression in algebra, "*a* into *b*."

The definition of multiplication has always given trouble on account of the continual broadening of the idea. As soon as a fractional multiplier appears the primitive definition ceases to be valid. For example, we do not look out of a window half of a time, and hence the expression "$2\frac{1}{2}$ times 4" is meaningless unless we extend the significance of multiplication and of the word "times." This has been done, and no one objects to saying "$2\frac{1}{2}$ times 4" at present, although many would still object to saying "$\frac{3}{4}$ times 4," which would be quite as justifiable if it were not that we have as short expression, and one that is more exact, in "$\frac{3}{4}$ of 4." There is no definition of multiplication that covers the cases needed in elementary and secondary classes, and that is at the same time simple enough for children. It is doubtful if there is any advantage in learning a definition like the familiar one that "multiplication is the process of taking one number as many times as there are units in another." The important thing is that the term should be correctly used, but that a definition covering the case of $-\frac{1}{2}\sqrt{3}\times(-\frac{2}{3}\sqrt{-1})$ should be learned by beginners is not at all necessary. One of the best of the elementary definitions is the one that states that multiplication is the process of finding a number that is derived from the multiplicand in the same way that the multiplier is derived from unity; but this is open to the objections of difficulty as well as uncertainty. It is, however, one of the oldest of our definitions, appearing in the works of Maximus Planudes in the fourteenth century and in many of the first printed textbooks.

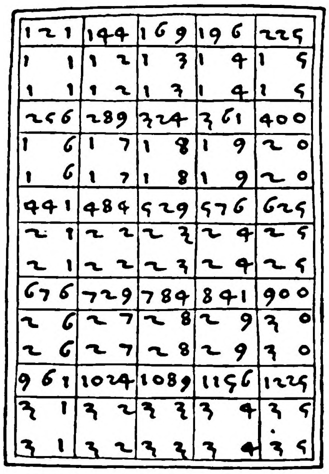
Of the terms employed, "multiplicand" comes from *numerus multiplicandus*, "Anglico ye nombur the quych to be multiplied" (as our earliest English manuscript on the subject translates it). It appears in this full form in most Latin arithmetics, but finally *numerus* was dropped, as in the writings of Licht (1500), Huswirt (1501), and Cirvello (1505), leaving only *multiplicandus*. The word "multiplier" has had a varied career, appearing as *multiplicans*, *multiplicator*, *moltiplicante*, and *multipliant*, besides having various other forms. The word "product" is relatively modern as limited to multiplication. It has as often been applied to the result of addition, meaning simply the outcome of any operation. Instead of product, *factus* has been used by good writers, and there is some reason for this usage in view of the word "factor." This brief historical sketch is introduced to suggest a doubt as to the necessity for the difficult technical terms now taught to children. The early writers spoke of the number to be multiplied, which in Latin is *numerus multiplicandus*, and there is no reason why we should not say "number to be multiplied" to-day, at least to primary children. Neither is there any reason why we should not use "answer" or "result" for all of the operations. In time it is probable that some such simple terms will be evolved.

As to the operation itself, the history is very long. Bhaskara (*q.v.*) gives five plans, and Pacioli (*q.v.*) gives eight. One of these was known as the "grating" or "quadrilateral" plan, and is here shown from an Italian manuscript of about 1420. It was also known as the "gelosia" plan, because the Venetians called the gratings in front of their windows by this name, — whence the modern French *jalousie* for a kind of a

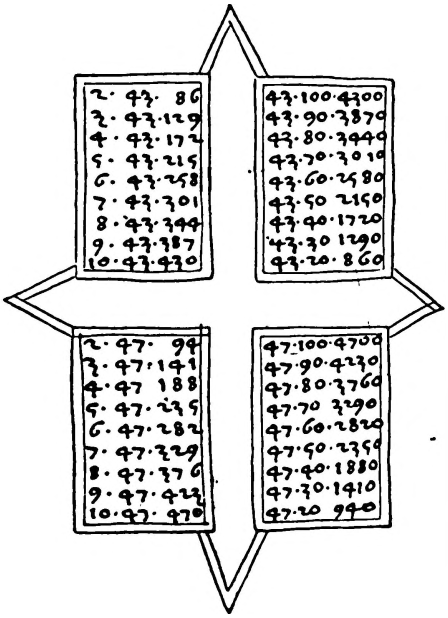


blind. Out of all the plans that have been suggested, only one remains in common use. This was invented by the Florentine business computers, and went by the name of the *bericocolo* method, because it represented the numbers arranged in little squares such as were found on a kind of cake (*bericocolo*) and used in Tuscany. The Venetians more commonly called it by the name *scachieri* (*scacherio*, and other variants) because the little squares resembled those on a chessboard. It was long after the time of the first printed books that the older methods were completely abandoned for this one. The object of this historical sketch is to suggest that it is quite probable that we have not yet settled upon the best method. The introduction of decimal fractions (see FRACTIONS) has made it often necessary to multiply to only a limited number of decimal places, and the ordinary method carries the work farther than necessary. It seems possible that we may soon be teaching in the schools some contracted process that will carry the result only as far as needed.

The multiplication table has had three general forms. Of these the column arrangement is the oldest, being found in the clay tablets of ancient Babylon, of the third millennium B.C. The column table was often very extensive, running up to factors in the hundreds. The products were not memorized, but the tables were used for reference, and when a product was found in this way, the multiplication was said to have been performed "per colonna" (by the column). The following are parts of such a table taken from a Florentine manuscript of about 1450.



121	144	169	196	225
1 1 1 1	1 2 1 2	1 3 1 3	1 4 1 4	1 5 1 5
256	289	324	361	400
1 6 1 6	1 7 1 7	1 8 1 8	1 9 1 9	2 0 2 0
441	484	529	576	625
2 1 2 1	2 2 2 2	2 3 2 3	2 4 2 4	2 5 2 5
676	729	784	841	900
2 6 2 6	2 7 2 7	2 8 2 8	2 9 2 9	3 0 3 0
961	1024	1089	1156	1225
3 1 3 1	3 2 3 2	3 3 3 3	3 4 3 4	3 5 3 5



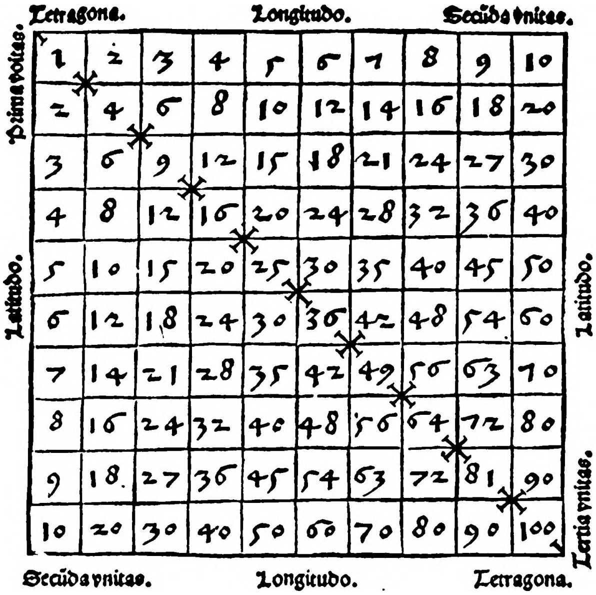
2·43·86
3·43·129
4·43·172
5·43·215
6·43·258
7·43·301
8·43·344
9·43·387
10·43·430

43·100·4300
43·90·3870
43·80·3440
43·70·3010
43·60·2580
43·50 2150
43·40·1720
43·30 1290
43·20·860

2·47·94
3·47·141
4·47 188
5·47·235
6·47·282
7·47·329
8·47·376
9·47·423
10·47·470

47·100·4700
47·90·4230
47·80·3760
47·70 3290
47·60·2820
47·50·2350
47·40·1880
47·30·1410
47·20 940

A second form was used by the more scientific writers. It was the square array, and was commonly called in Medieval and Renaissance times the Pythagorean table (*Mensa Pythagorica, Tavola Pitagorica, Table de Pythagore*). It first appears in print in an edition of Boethius, although Boethius probably never knew such a table, this being an interpolation of some later copyist. The following illustration shows the table as it appeared in the first edition.



Tetragona.
Longitudo.
Secunda unitas.
Prima unitas.
Latitudo.
Latitudo.
Tertia unitas.
Secunda unitas.
Longitudo.
Tetragona.

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

The third standard form of the multiplication table is the triangular array, formed by cutting the square along the crossed diagonal in the preceding illustration. This was used by many early writers of mercantile arithmetics.

The question of learning the multiplication table as such has agitated some teachers in every generation. It is one of the most patent facts in education that children and adults are deficient in the combinations of numbers in addition and multiplication, and that, with all the time at the disposal of the schools these number facts should be more thoroughly known than at present. The tendency of a generation ago to let the child acquire these number facts as the need appeared, memorizing them as acquired, has happily been checked. Unless the table is learned thoroughly, as such, not all of the combinations will receive the requisite attention. It should be the subject of constant oral drill, and if possible it should be placed where it can also be seen. Besides the tabular drill there must be an equal amount of drill upon the isolated combinations, 4 × 7, 9 × 6, and so on. This learning of the table does not exclude the introduction of motive, nor does it in any way interfere with modern ideas as to how number facts should first be presented.

The explanation of the process offers few difficulties. In general, it is well to give the full form of any operation first, followed at once, and before the pupil acquires his habits of work, by the form to be used in practice. The explanations of the ordinary textbooks are generally quite sufficient for the purpose in view. D. E. S.

See CHECKS ON COMPUTATIONS.

MUMPS. — Mumps, more technically parotitis, or parotiditis, is an acute, highly infectious, febrile disease, characterized by swelling of the parotid gland. It breaks out in brief, but intense, epidemics, usually during cold and wet seasons. Though few not rendered immune by previous attacks escape infection, these epidemics bring little or no mortality. It is rare in infancy and after middle age and commoner in males than in females.

The cause of mumps is obscure, though probably a microbe present in the saliva and disseminated by the breath. The period of incubation is long, from two to three weeks, often nineteen days, and the disease runs its course in about a fortnight more.

As a rule, premonitory symptoms are absent or very mild. The onset is sudden, with pain and stiffness at the back of the lower jaw, followed in a few days by the characteristic swelling of the region just under the lobe of the ear, and extending forward and downward to a degree depending on the severity of the case. A moderate fever lasts for four or five days. The swelling reaches its height in from two to five days, is stationary for two days, then rapidly subsides. The inflamed region is painful and very tender. In some cases the skin may redden and even peel. Speech is difficult and muffled. Swallowing or mastication is painful and the diet must be exclusively fluid. The head is bent forward or toward the swollen side. There may be headache, earache, vomiting, and other symptoms of general ill health. In mild cases there may be but little pain or swelling, but these cases are as infectious as the severe ones.

The most common complications are swelling and pain in the testes, mammæ, and ovaries, which may follow subsidence of the parotid inflammation, particularly in adolescents and adults. In rare cases the inflammation is transferred to the brain and death may result from meningitis. In any event, the patient, even in mild cases, should remain in bed until convalescence ensues. The disease is self-limited and the treatment consists primarily in insuring free action of the bowels and protection of the swelling from cold.

The period of infection extends from the appearance of the swelling for some three weeks, or about two weeks after the fever subsides, though some authorities believe that infection is spread in school during the period of incubation. Children suffering from mumps should be excluded from school for at least four weeks after the swelling appears. Opinion differs as to whether other children living in the same house should also be excluded. In any event, it is rarely necessary to close the school as a precautionary measure.

G. M. W.

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MUNICH. — See GERMANY, EDUCATION IN; INDUSTRIAL EDUCATION.

MUNICH, ROYAL BAVARIAN LUDWIG-MAXIMILIAN UNIVERSITY OF, GERMANY. — The history of the present university at Munich dates back to the foundation of a university at Ingolstadt by Papal Bull obtained by Duke Louis the Rich in 1459. The opening, however, was delayed and took place in 1472, with faculties of theology, law, medicine, and arts. The university was modeled on the University of Vienna. Ingolstadt played a prominent part in the Renaissance period and numbered among its teachers Celtes, Reuchlin, and Aventinus. During the Reformation it became the rallying point of Catholicism, Dr. Eck, Luther's opponent, being then a member. From the sixteenth (1556) to the eighteenth century the university was under Jesuit control in all its faculties. In 1772 the Jesuits were removed from the university, and the theological faculty was placed under the Benedictines. Under directorship of J. A. Ickstatt in the middle of the eighteenth century much progress was made. In 1799 a *Kameral-Institut* was established, which developed into a faculty of political science and economics, and for a time included also technology, agriculture, and forestry. In 1800 the university was moved to Landshut, and received the present title in 1802. The transference to Munich took place in 1826, much to the advantage of the university, which was now practically amalgamated with the Academy of Science. The royal family were strong supporters of the institution. New buildings were provided in 1840, and a hostel (Maximilianeum) was established by Maximilian II. In 1868 a *Technische Hochschule* was established in Munich, and agriculture and to some extent forestry were provided for in separate institutions. Courses have been increased; the collections have been augmented, and institutes and seminars have been added. The following faculties are maintained: theology (Catholic); law; political science; medicine; and philosophy (section for philosophy, philology, and history, and section for mathematics and science). The enrollment in the winter semester of 1910–1911 was 6905 matriculated students and 691 auditors, and in the winter of 1911–1912, 7579.

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MUNICIPAL COLLEGES AND UNIVERSITIES. — England. — As education became a function of the state, the tendency was to put the responsibility for elementary education upon the local communities. Gradually that responsibility has been extended to the post-elementary grades. And of late there has been manifest a disposition on the part of great cities to provide the means of higher education rather than to wait for private initiative and the sporadic philanthropy of personal generosity. The municipal colleges of England and the United States are expressive of this high purpose. It must not be understood, however, in speaking of municipal colleges in England, that they are established or maintained by the municipal authorities. In all cases these universities and university colleges have been established by private benefactions and are still maintained largely by private endowment. It is only since the beginning of the present century that the municipalities have been contributing gradually more and more to the maintenance of the institutions in their midst. Further, they take an active part by maintaining scholarships and prizes in the universities, and also have representatives on their governing bodies. The institutions are also civic in the sense that their success is more and more coming to be a matter of local pride, and many of the benefactions are inspired by civic spirit as much as by the desire to promote education. The local universities, chartered within the last few years, are Birmingham, Bristol, Leeds, Liverpool, London (reorganized), Manchester, and Sheffield (*qq.v.*). There are also a number of university colleges, which, however, do not grant degrees: Nottingham, Reading, Southampton (*qq.v.*). To these must be added the constituent bodies which make up the University of Wales (*q.v.*), and the new University of Belfast (*q.v.*), and the colleges of the National University of Ireland (*q.v.*), all of which have strong local affiliations. These civic institutions had their origin in an endeavor " to raise the intellectual level of the town " in which they were placed. But situated, as they are, in the center of England's commercial and industrial life, and confronted by an intense desire of their students for greater efficiency in these activities, they immediately widened their scope of work and became strongly technological. The government commission, in its report of 1907, complains that it " cannot distinguish between the university and the technical work."

Organization. — The universities and colleges are organized into faculties; *e.g.* at the University of Manchester there are the following faculties: arts, science, law, music, commerce, theology, technology, and medicine, and a department of education. In each faculty ordinary and honors degrees (*q.v.*) are given at the end of a course of three years (except in medicine). While there is a system of election for the ordinary degree course, the subjects are taken in closely allied groups. Each of the universities has the power to inspect and examine schools on request. The northern universities, Manchester, Leeds, Liverpool, and Sheffield, have combined to form a Joint Matriculation Board, which holds a combined entrance examination for the universities and also inspects and examines schools, granting school certificates on the results. The universities are also represented, as a rule, on the governing bodies of local secondary schools and local education committees.

Relation to the Community. — These institutions justify their name, civic universities, because each makes a special effort to meet the economic problems of its city. In Sheffield, for example, the cutlery center of England, the local university has an excellent " School of Metallurgy." " No laboratory is better equipped than this. The manufacture of crucible, Siemens, and Bessemer steel is carried on, on a commercial scale." Leeds is England's textile center. The civic university of that city has a school of "Textile Industries" and another of " Dyeing and Color Chemistry." In Birmingham mining is prominent, and in Manchester "much research work has been done in chemistry and physics and their application to the Cotton City's industries." Industrial England is looking to these civic universities as agents in promoting her economic efficiency or supremacy.

No applicant is admitted to these schools unless he can meet the standards of general culture. These requisites allow a certain amount of election according to a student's previous training. Thus at Manchester English language or literature, English history, and mathematics are compulsory, while a choice of three other subjects (including a foreign language) out of nine is allowed. But there are no prerequisites according to the future work of the students, with the possible exception of medicine. An applicant for a certificate in any branch is not required to meet the same high level of preparation as the young man who seeks a degree.

Financial Support. — The sources of income of these universities can be grouped under the following heads: —

(1) Endowment fund. (2) Private donations to the general fund. (3) Private donations for specific endeavors. Money is frequently given for a library, a special school, a new department, special research, new courses to train for efficiency in some industry. The Clothworkers' Company of London gave the University of Leeds £4000 a year, revocable at pleasure. This donation was made permanent upon the establishment of the "Department of Clothworkers." Such donations are typical of a large number. (4) Student fees. Though the fees are reasonable, an attempt is in process to reduce them further and make them uniform. (5) National government subsidy allotted annually. A regular commission on "Grants in Aid to University Colleges" decided upon a proportional allotment to each institution. These subsidies are usually divided among the universities in proportion to the fund that each can raise from all other sources. (6) The municipal grant. The municipality or the county within whose limits the university is situated makes an annual grant. In many instances the income from the municipal treasury is insignificant in comparison to the other sources.

Students. — These universities are coeducational. Sessions are held at night as well as during the day; those in the industries are thus enabled to take the technical courses. In no universities, however, do evening courses count toward a degree. Many of these students come from distant cities and foreign countries to avail themselves of the specialties of the different universities. No better index of the need of the work of these universities need be offered than their growing popularity. Their influence is shown in the following table: —

	Teaching Staff	Day Students
University College, London	134	1356
Bristol University . . .	123	700
Manchester University .	242	1557
Leeds University . . .	152	901
Liverpool University . .	219	1078
Birmingham University .	148	1017
Sheffield University . .	150	885 + 1818 evening

United States. — In the United States such civic institutions are in a stricter sense municipal colleges. Every Western state maintains its university, which is, not only in its purposed service, but also in its support, public; and many other states contribute largely toward the support of such institutions. But beyond this, cities have made provision of like character. Charleston and Baltimore have for many decades supported institutions known as "city colleges," but the two most notable examples are the University of Cincinnati (*q.v.*) and the College of the City of New York. The former, made possible by a large private gift, is a consolidation of an original college and neighboring schools of medicine, law, engineering, dentistry, and education. Its student body of 753 college students and 709 professional students, its teaching staff of over 200, and its manifold activities are supported by the original endowment just referred to and in part by city contributions.

The purest type of a municipal college is the College of the City of New York. (See New York, College of the City of.) It is governed by trustees appointed by the city, and receives graduates of the city high schools upon certificate. It is a municipal college in the truest sense of the term, for it is supported solely by the city; its unexcelled physical equipment, costing $5,000,000, was paid for by the city; it is open only to residents of the city who meet the entrance requirements, and to them without fees. In its development it is looking toward fitting young men for highest service to the city..

Germany. — While municipal universities as such have not been established in Germany, there is a tendency for the universities situated in the large towns to flourish in point of numbers at the expense of the small universities. This is further drawing attention to the fact that the largest and wealthiest centers of population are not provided with facilities for higher education. A new era has been inaugurated in this field by the establishment of a university in Frankfort-a-M. (*q.v.*), in which private munificence and the civic authorities had a large share. It is very probable that before long a similar institution will be established at Hamburg. J. H. F.

MUNICIPALITY. — See City Schools; City School Administration.

MÜNSTER, WESTFÄLISCHE WILHELMS-UNIVERSITY OF, GERMANY. — The present university, although one of the most recent of German foundations, has historical continuity with the Gymnasium Paulinum conducted by the Jesuits at Münster in 1588. Efforts were made to establish a university early in the seventeenth century, and although privileges were obtained from the Pope in 1629 and the Emperor in 1631, nothing more was done. In the next century, however, through the untiring energy of Electoral Prince von Fürstenberg, a Papal Bull and the Emperor's consent were obtained in 1773 for the erection of the university. But the endowments were so poor that the opening with faculties of theology (Catholic), law, and philosophy was delayed until 1780. Chairs in medicine were added gradually. The numerous wars of the period, however, were a check on progress. Hopes for the future were entertained under Prussian rule, but they came to nothing, since the government decided to found a university at Bonn in 1808, and to close the faculties of law and medicine at Münster, leaving to it only theology and law and the title of *Akademische Lehranstalt.* The work of the institution was thus confined to training Catholic theologians and the few candidates for the higher teaching profession. In 1843 the title of Royal Theological and Philosophical Academy was granted, with university privileges. New chairs were added from time to time after 1858. After 1875 a further development took place; new chairs were created, seminars were added, an auditorium and chemistry laboratory were erected, and an archæological museum, botanical institute, geographical equipment, and a museum of medical and modern art. In 1900 the Province of Westphalia and the city of Münster raised funds for the local institution, and in 1902 a faculty of law and political science was established and university privileges were granted. In 1907 the title Westfälische Wilhelms-Universität was adopted. A faculty of medicine has not yet been established, but five semesters toward a complete medical course can be completed at the university. The following faculties are now in existence: Catholic theology; law and political science; philosophy (philology-history, mathematics-science, and pharmacy). The enrollment in the winter semester of 1911–1912 was 2314.

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MURMELLIUS, JOHANNES (1480–1517). — A Dutch scholar and schoolman; was born in Roermond, Holland, and educated at the schools of Deventer, where he became a pupil of the famous humanist Hegius. From 1498 to 1513 he lived at Münster, Westphalia, where (1509) he was appointed rector of a Latin School. In 1510 he took a similar position in Olkmar, Holland. He was the author of many widely used textbooks, such as the *Pappa puerorum,* a beginners' book in Latin, also an anthology of Latin poets, and a textbook on versification. With Reuchlin (*q.v.*) he took part in the fight against the enemies of humanism. His life has been written by Reichling (Freiburg, 1880), who also published a selection of his Latin poems with a German translation. F. M.

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MURRAY, DAVID (1830–1905). — Educator. Graduating from Union College in 1852, served as instructor in Albany Academy (1852–1857) and principal of that institution (1857–1863), and professor in Rutgers College (1863–1873). From 1873 to 1879 he was adviser to the Minister of Public Education in Japan, and from 1880 to 1889 was secretary of the Board of Regents of the University of the State of New York. He was the author of *Land Surveying* (1869), *Japanese Education* (1876), and *History of Education in New Jersey* (1899). W. S. M.

MURRAY, LINDLEY (1745–1826). — Author of Murray's grammars, readers, and spellers. He was educated in the schools of the Society of Friends, and taught for a short time in a boarding school at Burlington, N.J., and later at Holdgate, near York, England. His *English Grammar* was published in 1795; his *English Reader* in 1779, and his *Spelling Book* in 1804. All these textbooks passed through many editions, with numerous "sequels" and abridgments. His *Autobiography* was published by Elizabeth Frank after his death. W. S. M.

See Grammar; Latin Grammar.

MURPHY, JOHN J. (1844–1892). — Jesuit educator. He was graduated at Carlow College, Ireland, in 1862, and came to the United States and joined the Society of Jesus four years later. He was instructor and professor in several American Jesuit colleges, and was president of St. Francis Xavier College (1885–1888). He wrote several philosophical papers. W. S. M.

MUSCLE READING. — See Mind Reading.

MUSCLES, FUNDAMENTAL AND ACCESSORY. — In the course of animal evolution, the small fine muscles of the body have gradually been evolved by differentiation within the structure of the larger muscles. Thus, the muscles which control the lips of the human mouth have been evolved out of a relatively simple gross muscle, which in the lower forms of animal life controls the mouth opening. The muscles of the hand have become gradually differentiated from the gross muscles controlling the forward extremity of the lower animals. This fact of animal evolution has been cited by students of education as ground for the general principle that the child's muscular training should follow the same genetic order. The grosser muscles should be first brought into action, the finer muscles should be reserved to a later period of education. This statement with regard to muscular training has sometimes been put in a form which accentuates further the significance of the difference between fundamental and accessory muscles. It has sometimes been said that the finer muscles are immature at the beginning of individual life and unable to perform any work. Such a statement as this last overlooks the fact that even the relatively undeveloped movements of earlier infancy involve the contraction of the finer muscles. Thus the closing of the fist as it appears in every normal infant involves the contraction of all the finer muscles of the hand as well as of the grosser muscles. The contraction of the vocal cords in like fashion involves some of the most delicate muscles of the body. The rolling of the eyes depends upon the contraction of the fine muscles of the eye.

In the early stages, however, these fine muscles are not capable of acting in such a way as to produce complex or highly differentiated coördinations. Thus it is quite impossible to move one of the fingers at this early stage in a direction different from the general movement which is being made by all of the fingers of the hand. While the fine muscles are thus capable of contraction, they are not capable of highly differentiated movements. The distinction should be made, therefore, not between the small muscles and the large muscles, but between the fine differentiated coördinations and the grosser coördinations. The development of the fine differentiated coördinations is undoubtedly slow and requires sensory and motor control of a very highly organized type.

C. H. J.

See Coördinations.

MUSCULAR SENSE. — The organs of movement, especially the joints and muscles, are provided with sensory nerve fibers which send to the central nervous system sensory currents whenever the limbs or other muscular organs of the body are moved. The significance of motor processes for mental development has long been recognized in psychological writing. The muscle sensations have been described by such writers as Bain and Wundt as avenues through which bodily movements contribute to mental development. C. H. J.

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MUSÉE PÉDAGOGIQUE. — See France, Education in; Museums, Educational.

MUSEUMS, EDUCATIONAL. — The educational museum may be defined as an institution to conserve and display collections which have an illustrative, comparative, or critical relation to the schools and to school work, or which are concerned with education as a profession, a science, or a social institution. The mention of a confusion in the use of the term "educational museum" will make its proper significance more clear. Museums located in a school or organized as an adjunct to a system of schools, and aiming to aid school instruction directly and immediately, are sometimes called "educational museums." Their contents are related to education; but since their collections are designed as a supplementary agency in instruction, they may better be called "school museums." They can be sharply distinguished from the "educational museum": the school museum is itself didactic, it exists for the pupil directly; it includes only the means of teaching, that is, the apparatus, appliances, and materials of teaching brought together for use in actual instruction. Distinguished from the school museum is the type of museum which is related to education as an institution, a profession, or a science, rather than to actual teaching; which exists not for the pupil, but for the teacher, the person interested in school administration, the student of education, and the general public; the collections of which illustrate not only the means and appliances of education (and these not to be used in teaching, but to be studied and considered for themselves), but in addition, it may be, the methods of education, its results, its organization and administration.

The function of the educational museum may also be defined by comparison with the educational library, the educational laboratory, the model school, and the school exhibit and exhibition. The educational library contains all printed material relating to education; the educational museum contains all objective collections; the museum, however, includes all printed material more properly treated as exhibits for inspection or as gross data for elaboration, than as books for circulation; namely, collections of school textbooks, teaching manuals, archives of school catalogues and reports, and perhaps bulky illustrated works, as on school architecture. The educational laboratory undertakes investigations in education, and gathers books and objective collections as demanded by these investigations; it has no function of public visitation, as the museum, or of circulation of its resources, as the library; its activities are centered in its scientific studies. The model school or practice school of an institution for training teachers might be called a dynamic museum of education. By the school exhibit is ordinarily signified a temporary display of the results of pupils' work, together with the school building and its equipment, usually opened to the public for one or more days at the end of the school year. The school exhibition or exposition is a centralized display of such exhibits, chiefly including samples of pupils' work, brought together for a city or larger district for a longer or a shorter time; organized, it may be, independently or in connection with some industrial exposition. Such educational expositions often include manufacturers' exhibits of teaching appliances, school furniture, textbooks, and other materials. In so far as these exhibitions bring together displays which have been prepared disinterestedly, so far they do temporarily part of what educational museums do permanently. In so far as manufacturers' exhibits enter on a competitive basis, the exposition is of a different genus from that of the educational museum. (See EXPOSITIONS, INTERNATIONAL, AND EDUCATION; EXHIBITIONS, SCHOOL.)

There have been seventy-five or more educational museums projected in some twenty-five different countries since 1850. Credit for the first one is due to Egerton Ryerson, Provincial Superintendent of Education for Ontario, Canada, who in 1845 was granted £100 to purchase samples of school models, copies of which he had seen in American schools and which he thought Canadian manufacturers might duplicate. The collection of school aids became part of the Canadian Museum, opened at Toronto in 1856, and afterward known as the Educational Museum, until 1897, when the name Provincial Museum was assumed. At about the latter date the last purely educational exhibits were retired from the museum. The educational collections at Toronto realized certain important results: they distinctly improved the teaching equipment of the schools of the province both through force of example and by the direct agency of the government in selling to the schools duplicates of the exhibits shown; they led, within ten years, to Canadian manufacture of teaching materials, school desks, and other requisites, so that the depository and sales bureau of the government could later be dispensed with; they influenced American schools through the visits of various American teachers, especially through the stimulus given to Principal Sheldon (*q.v.*) of the Oswego Normal School, who inspected the Toronto collections about 1860 and as a consequence initiated the "Oswego movement" (*q.v.*) in American education.

Though the idea of a museum of education is claimed for the French school inspector, Jullien, who wrote about 1817, the Crystal Palace Exhibition in London in 1851 assuredly gave the stimulus to the first two European educational museums, — the Collection of Teaching Appliances of the Royal Bureau of Commerce and Industry for Württemberg, organized at Stuttgart in 1851 and still forming a section of the National Industrial Museum in that city; and the Educational Section of the South Kensington Museum, London, 1857–1888. Indeed, a large proportion of educational museums owe their beginnings to the educational sections of international expositions. A survey of the educational museums of the world is the basis for the following statement of their usual collections and activities.

Such exhibits may be organized according to (1) the progressive stages of school work, the kindergarten, the elementary grades in turn, and higher education; or (2) the subjects of instruction, as geography, history, industrial arts, or what not. Both schemes of classification have been followed; each has its obvious advantages. These materials of instruction, including textbooks as well as "aids," appliances, illustrations, material, and teaching equipment of all sorts, the teacher's tools in short, form the item of first importance in a dynamic museum, one that seeks to improve teaching. It is significant that in the statutes of sixty-seven museums, assistance to teachers is mentioned by forty-two as their first aim, and the collection and exhibit of teaching appliances by fifty-seven as their most important work. The collection of teaching appliances is made vital by the effort to secure new and improved types as soon as they come upon the market, and by prompt criticisms in the educational press, while in a few cases museums have sent out traveling exhibits of new appliances that teachers may see the latest and best.

With emphasis upon new and improved appliances, one in five museums at least plans to include foreign exhibits, thus looking to that international exchange of ideas so important to educational progress. Some striking instances of this international movement in educational ideas are afforded by the Toronto, Tokyo, and South American museums. It might be urged that these museums all aided in the improvement of education in new countries; the French and German museums, however, show that the educational museum has still a function for progress even in advanced countries.

The next most common exhibits are those of the school building and its furnishings. The comparative study of architecture, or, to mention a more limited topic, the school desk, could be facilitated by the aid of the educational museum, and either topic is worthy of research. The school building itself forms a division in most educational museums, illustrated by architects' drawings and blue prints of floor plans, elevations, and their details. Such exhibits make possible a comparative study of the school plant, and may extend the adoption of good architecture. Such collections furnish the necessary foundation to treatises upon school architecture, which ought to be more than compilations of pictures, and should offer wise criticism based on wide comparisons.

Other exhibits mentioned in the plans of different museums are the following: those illustrating school organization as record blanks and reports; samples of pupils' work, to illustrate the results of instruction; historical exhibits — a feature in one in four of the museums; an educational library, an historical library, archives of school reports, collections of textbooks, of children's literature, and of school and other pictures. Two or three of these items merit an extended notice.

Exhibits of children's work, the immediate material results of the teaching process, have had small place, usually, in educational museums. They have always been a large feature of temporary educational exhibitions. Usually regarded as of ephemeral value, these exhibits have in a few instances, notably the Paris museum, been created into permanent displays. Their utility resides in the possibility which they afford of comparisons of progress in the schools; to be reliable for this purpose, they must be originally compiled with accuracy and under known conditions. Limited in amount, and organized in albums, such exhibits of children's regular school work, or perhaps of the results of tests and examinations, might become educational records of great value.

Historical exhibits of various kinds have been made. Some of these are memorials of educators, as the collection in the *Deutsches Schulmuseum* in Berlin, and the collection of physics apparatus made and used by Professor Schaeffer at Jena, and now maintained there as a memorial to him. Most striking of all are the Pestalozzi memorials at Zürich and the Comenius collection at Prague, while the great educational library at Leipzig, the *Pädagogisches Zentral* (*Comenius-Stiftung*), although not a museum primarily, is in itself a memorial of this type. Very suggestive as a type of possible historical exhibit is the Hamburg School-History Collection, which by means of prints, photographs, pupils' books, textbooks, old school reports, and the like represents the development of local education. Any community might in a similar simple way preserve within its main school building such memorials of its own educational history. Another type of historical exhibit is that illustrating the development of particular school subjects, as the Breslau museum display illustrating the evolution of charts and other appliances for religious education and for the teaching of mathematics. In this category, too, belong the unique historical collections of manuscripts and textbooks of arithmetic, grammar, readers beginning with hornbooks, penmanship, and other school subjects, in the private library of George A. Plimpton, Esq., of New York.

Special collections are features of some museums: sometimes collections of local natural history or industry, often exhibits of school art and schoolroom decoration, school hygiene, pictorial collections, or teaching materials for individual subjects, as religion, arithmetic, or drawing. In a few instances, educational museums devoted entirely to a limited field have been proposed: as, the projected museum of Froebel memorials at Eisenach; the museum of industrial education at Frankfort (1900–1902); and that of deaf-mute education at Leipzig.

The educational library is the natural adjunct to the museum. There is some sort of book collection with practically every museum. The Paris and the Berlin city museums have each a large library; and others have frequently 5000 or more volumes. These libraries comprise books on education, textbooks, teachers' manuals, and the archives of school reports, regulations, programs, and like invaluable documentary records. The possibilities of the last-named item are indicated by the collection of several thousand serial catalogues and reports, annually augmented, on file in the Educational Library of New York State. Special book collections are found with certain museums: catalogues and books relating to teaching appliances; children's books; in many cases, reading rooms with educational journals on file. (See LIBRARIES, EDUCATIONAL.)

Another view of the educational museum as an institution may be secured by observing its activities. Over half the museums loan out exhibits, in a few cases directly into the schools; in other cases to teachers and school officials for inspection and study. The St. Petersburg museum made a striking exhibit at the Centennial Exhibition in Philadelphia in 1876; the Rostock museum sends parcels of new teaching appliances over four different circuits, to forty-four different places of exhibit; and the Copenhagen museum has circulated exhibits and arranged accompanying lectures on school architecture, hygiene, etc. Lantern slides are loaned for purposes of instruction by several museums. The loan of books from the libraries is common. Temporary exhibitions are held by three fourths of the museums, and on such subjects as: children's literature, history of schools or of education, pictures and school decoration, manufacturers' loan exhibits of teaching appliances in special subjects as geography and drawing, exhibit of pupils' work in manual training and other subjects. The Paris museum has a section for publishers' loans in each of its departments; the Amsterdam museum has definite regulations governing manufacturers' loans; the Rio de Janeiro museum has as one feature an annual exhibit of pupils' work. The number of visitors is another measure of a museum's usefulness; the " mean " attendance for forty museums was from 1000 to 1500 per annum. Especially significant are visits by teachers and pupil teachers preparing for examinations, and by members of seminar classes, as is common in the German museums.

Publications of some form other than catalogues are issued by many museums:

(*a*) a periodical, in some cases a separate paper or perhaps a supplement or page in an educational journal which reports accessions, exhibitions, criticisms, etc.; (*b*) monograph studies giving historical material or the results of investigations have been issued by six museums at least; (*c*) school materials, whether books, new types of teaching appliances, or even, in one case, a school desk, have been brought out by certain museums in the effort to improve teaching equipment. The furnishing of information has been stated as the broad aim of these museums, and many serve as veritable bureaus of educational information for the territory they reach.

Finally, instruction for self-improvement, lecture courses, and even laboratory courses in natural science have been provided by some museums for teachers and pupil teachers, emphasizing that the museums exist for the teacher, and especially for the teacher in training. Significant to this same end is the tendency of educational museums to ally themselves with institutions for training teachers: the Toronto museum was connected with a normal school, the Tokyo museum has been annexed to the higher normal school; the director of the Paris museum has recently suggested affiliation with the University of Paris and the normal schools; in the university schools of education there has been a sentiment in favor of the organization of collections which may stand to educational research as do the natural history collections and historical archives to scientific and historical study. Herein, perhaps, lies the most promising function of the educational museum.

List of Educational Museums: The names are arranged by countries in alphabetic order. The first date indicates the year of opening; the second date, if given, the year of closing.

Argentine Republic. — 1. Buenos Ayres. *Biblioteca y Museo pedagógicos*, 1888.

Austria-Hungary. — 2. Agram. *Hrvatski Skolski Muzej*, 1901. 3. Bozen. *Ständige Lehrmittelausstellung*, 1889. 4. Budapest. *Országos Tanszermúseum*, 1877. 5. Graz. *Permanente Lehrmittelausstellung*, 1882. 6. Innsbruck. *Ständige Lehrmittelausstellung*, 1888. 7. Laibach. *Schulmuseum und Ständige Lehrmittelausstellung*, 1898. 8. Prague. *Stálá skolni vystava v Praze*, 1890. 9. Vienna. *Permanente Lehrmittelausstellung der Stadt Wien*, 1872–1892. 10. Vienna. *Österreichisches Schulmuseum*, 1903. 11. Vienna. *Permanente Lehrmittelausstellung der Gesellschaft Lehrmittelzentrale*, 1905.

Belgium. — 12. Brussels. *Musée scolaire National*, 1880.

Brazil. — 13. Rio de Janeiro. *Museu escolar nacional*, 1883.

Bulgaria. — 14. Sofia. *Ucilisten Muzej*, 1905.

Canada. — 15. Toronto. Educational Museum, 1845–1881; now Provincial Museum.

Chile. — 16. Santiago. *Museo de Educación Nacional*, 1911.

Denmark. — 17. Copenhagen. *Dansk Skolemuseum*, 1887.

France. — 18. Chartres. Educational Museum and Library. 19. Paris. *Musée pédagogique*, 1879.

Germany. — 20. Augsburg. *Die Schwäbische permanente Schullaustellung in Augsburg*, 1881. 21. Bamberg. *Die Permanente Lehrmittelausstellung in Bamberg*, 1896. 22. Berlin. *Das Deutsche Schulmuseum in Berlin*, 1876. 23. Berlin. *Das Städtische Schulmuseum in Berlin*, 1877. 24. Bremen. *Das Schulmuseum des Bremischen Lehrervereins*, 1902. 25. Breslau. *Das städtische Schulmuseum in Breslau*, 1891. 26. Cologne. *Die städtische Lehrmittelsammlung in Cöln a. Rh.*, 1901. 27. Donauwörth. *Die Permanente Lehrmittelausstellung des Cassianeums in Donauwörth*, 1876–1884. 28. Danzig. *Die Danziger Lehrmittelsammlung*, 1904. 29. Dresden. *Das heimatkundliche Schulmuseum in Dresden*, 1905. 30. Dresden. *Das Schulmuseum des Sächsischen Lehrervereins in Dresden*, 1904. 31. Eisenach. *Das Froebel Museum* (projected). 32. Frankfort. *Das Frankfurter Gewerbeschulmuseum*, 1900–1902. 33. Gleiwitz. *Das Oberschlesische Schulmuseum in Gleiwitz*, 1905. 34. Gotha. *Das Gothaische Schulmuseum*, 1889. 35. Hamburg. *Die Hamburger Lehrmittelausstellung*, 1897. 36. Hamburg. *Die Schulgeschichtliche Sammlung d. Schulwissenschaftlichen Bildungsvereins*, 1897. 37. Hannover. *Das Städtische Schulmuseum in Hannover*, 1892. 38. Hildesheim. *Das Schulmuseum (die Leverkühnstiftung) in Hildesheim*, 1891. 39. Jena. *Das Thüringer Schulmuseum in Jena*, 1889–1897. 40. Jena. *Das Schaeffer Museum*, 1900. 41. Kiel. *Das Schleswig-holsteinische Schulmuseum in Kiel*, 1890. 42. Königsberg. *Das Schulmuseum des Königsberger Lehrervereins, die Städtische Bibliothek für die Volksschullehrer*, 1881. 43. Kolberg. *Das Schulmuseum in Kolberg*, 1904. 44. Leipzig. *Die Permanente Ausstellung von Lehrmitteln in Leipzig*, 1865–1875. 45. Leipzig. *Deutsches Museum für Taubstummenbildung*, 1895. 46. Magdeburg. *Die Lehrmittelausstellung des Lehrerverbandes der Provinz Sachsen in Magdeburg*, 1877. 47. Munich. *Das Königliche Kreismagazin von Oberbayern für Lehrmittel und Schuleinrichtungsgegenstände in München*, 1875. 48. Oldenburg. *Das Schulmuseum zu Oldenburg i. Grossh.*, 1900. 49. Posen. *Das Posener Schulmuseum*, 1897. 50. Regensberg. *Die Oberpfälzische permanente Kreis-Lehrmittelausstellung in Regensberg*, 1880. 51. Rixdorf. *Das Naturhistorische Schulmuseum der Stadtgemeinde Rixdorf*, 1897. 52. Rostock. *Das Mecklenburgische Volkschulmuseum in Rostock*, 1888. 53. Stuttgart. *Die Lehrmittelsammlung der Königlich Württembergischen Zentralstelle für Gewerbe und Handel in Stuttgart*, 1851. 54. Wolfenbüttel. *Das Landes-Schulmuseum für das Herzogtum Braunschweig in Wolfenbüttel*, 1892.

Great Britain. — 55. London. Educational Section of South Kensington Museum. 1857-1888. 56. London. Educational Museum of Teachers' Guild, 1892.

Greece. — 57. Athens. ’Εκπαιδευτικόν Μουσεῖον, 1905.

Italy. — 58. Genoa. *Civico Museo pedagogico e scolastico*, 1881. 59. Rome. *Muzeo d'Istruzione e d' Educazione*, 1874–1881.

Japan. — 60. Tokyo. *Kioiku-kakubutsukwan*, 1878.

Netherlands. — 61. Amsterdam. *Nederlandsch. Schoolmuseum*, 1877. 62. Hague. *Museum ten bate van het Onderwijs.* (Projected.)

Norway. — 63. Christiania. *Skolemuseum for Kristiania Folkeskoler*, 1901.

Portugal. — 64. Lisbon. *Muse pedagógico de Lisboa*, 1883.

Russia. — 65. St. Petersburg. *Pedagogiceskij Muzej vojennoucebnych zavedenij*, 1864.

Servia. — 66. Belgrade. *Skolski muzej*, 1898.

Spain. — 67. Madrid. *Museo pedagógico nacional*, 1884.

Switzerland. — 68. Bern. *Schweizer. permanente Schulausstellung*, 1878. 69. Freiberg. *Musée pédagogique suisse de Fribourg*, 1884. 70. Lausanne. *Musée scolaire cantonal Vaudois*, 1901. 71. Lucerne. *Permanente Schulausstellung*, 1905. 72. Neuchâtel. *Exposition scolaire cantonal permanente*, 1887. 73. Zürich. *Pestalozzianum*, 1875.

United States of America. — 74. New York. Teachers College, Columbia University, 1899. 75. Washington. U. S. Bureau of Education, 1876–1906. In addition, museums or permanent exhibits of educational material have been contemplated or provisionally organized within the United States, by the city school systems of St. Louis, New York, New Haven, Connecticut, and Reading, Pa.; by the state museums of New Jersey, Pennsylvania, and Louisiana; by the State Education Departments of New York, Massachusetts, and some other states; by departments of education in the following universities: California, Clark, Harvard, Illinois, and Indiana; and by societies or associations: a geography exhibit by the Brooklyn, New York, Institute of Arts and Sciences, and a religious education exhibition by the Sunday School Commission of the Episcopal Church Diocese of New York, and by the Religious Education Association.

Uruguay. — 76. Montevideo. *Museo y Biblioteca pedagógicos,* 1889. B. R. A.

See also Expositions, International and Educative; Exhibitions, School.

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MUSEUMS, SCHOOL. — Quite apart from formal laboratory equipment and materials on the one hand, and the usual school tools, as slates, books, pencils, on the other, there exists a broad field of illustrative materials, pictures, specimens, models, what not, used in instruction, the organization and care of which constitutes the province of the school museum. Its divisions may be as many as the subjects of instruction which are capable of objective illustration. American schools, while emphasizing laboratory methods and the use of textbooks and other tools of teaching, have done less than European schools to utilize illustrative materials.

The simplest " school museum " is the schoolroom collection made by the teacher or by the pupils themselves to illustrate the subjects of study, geography, history, or nature study. The saying that the usefulness of the school museum is in its making, not in its use, refers to collections made by pupils; it is an axiom of partial application, however, for the room collection should grow from year to year and receive adult curatorship. The room collection merits suitable accommodation: a good-sized cupboard with glass doors above for display, a vertical-file drawer 11 by 14 inches at least in section, with alphabet guides for the picture collection, and other drawers both shallow and deep for the storage of objects. Such a room collection will furnish material of increasing value each year for illustrating topics in the course of study and for arranging occasional small exhibits by the pupils, who will get valuable training in its care as well as knowledge by its use.

Room collections may be brought together for a school building into a " school museum " proper, as books are centralized in a library. Indeed, the school museum is a " library of objects," and may be administered with the school library. The essentials are a well-lighted room with (*a*) a few exhibit cases of suitable height for changing displays, arranged now by the librarian or curator, now by this grade or that as illustrative problems for the enjoyment of the whole school; and (*b*) ample storage facilities for the systematic care of (1) pictures, photographs, magazine illustrations even, in properly indexed vertical-file drawers; (2) lantern slides arranged on shelves in long boxes which convert them into vertical-file records as easily classified as a library card catalogue itself; similarly, stereoscopic views, and a set of illustrations for the projectoscope if the reflecting lantern is used; (3) a collection of objects, minerals, woods, and other nature materials, textiles and other industrial materials, models, maps, charts, etc., stored compactly and systematically in drawers and cupboards without display; and (4) living exhibits, a vivarium to include plants, animals, birds, fish, etc., especially in urban schools. For the objective collections there is perhaps no better method of classification than by general subject numbers, as, *e.g.*, in the Dewey library classification, with sequence numbers 1, 2, 3 . . . within groups; or sequence numbers alone may be used. In either case a card catalogue with direct and cross references will be useful, and in a large collection indispensable. Such a school museum is (1) a supply bureau for illustrative materials to be taken into classrooms and used in teaching; (2) a room where pupils may secure information at first hand from concrete materials, as in the library from books; (3) a display room for changing exhibits (the fixed unchanged exhibit, be it of ever so much initial interest, is soon dead material); and (4) an important avenue for the expressive activity of pupils in organizing exhibits for their own rooms, or within the museum itself.

The third stage in the school museum is the central loaning bureau of teaching materials for a system of schools, organized with or without exhibit rooms. The central depository and loan bureau is best illustrated by the " Educational Museum " so-called, the school museum of the St. Louis schools. Organized in 1905, this museum reaches by weekly wagon delivery and collection over 100 school buildings of the city, with selections made on previous order from its rich and varied collections. There are over 1000 separate collections (objects, mounted specimens, pictures, charts, lantern slides, stereoscopic views), many of them in duplicate so that several schools can have the same exhibit at one time, which furnish illustrations of " food, clothing, natural objects, industrial objects, animals, plants, minerals, national life, physical geography, physics, history, astronomy, physiology." Brief descriptions accompany the exhibits, with titles of reference books. A detailed catalogue of the museum is put in the hands of every teacher, and its service is regarded highly. Certain exhibits which cannot be transported to the schools are available for inspection by teachers and principals at the museum. A similar bureau, though more limited in scope, was organized by the teachers of geography in the Chicago schools a few years ago, and was then taken over by the Chicago Normal School. Similar foreign experience, for example the school museum conducted for many years by the School Science Education Association at Hamburg, and the circulating materials in the Liverpool schools, might be cited. The possibilities in a state bureau for circulating materials among schools are suggested by the activities of the New York State Education Department in loaning framed and unframed pictures and lantern slides, and in depositing slides permanently with school authorities. Similar slide loaning services have been organized elsewhere: the Musée Pédagogique in Paris, Teachers' Guild Museum in London, and Educational Museum in St. Petersburg are examples.

Traveling Museums. — The museum which as an institution has its activities primarily limited by its own walls, has widely extended its usefulness by the development of circulating collections or traveling museums. The natural history collections which are sent out from the central museum and reach the children in their own schoolrooms is one example of the traveling museum; the great English loaning system centering in the Victoria and Albert Museum is another, with its traveling exhibits of woods, metals, textiles, science specimens, and apparatus, and samples of art and art industrial work. Commercial agencies have often employed the traveling museum: the school decoration movement in the United States received great impetus from the local display by publishing houses of pictures and casts, the receipts of which went for the purchase of selections for the schools; the state governments have sometimes sent over the country samples of their products to attract settlers. The traveling exhibit has been found most effective in social education; the anti-tuberculosis crusade has possibly achieved as much by its exhibits as by any one agency. The New York State system of loaning photographs and slides; the art movement in certain states, taking the form of circulating art exhibits; and more recently the development of agriculture extension education by means of demonstration railroad trains are other examples of successful traveling museum work. The demonstration trains usually contain not only accommodations for lectures and demonstrations, but exhibits which enforce lessons in farm management, improved equipment, and other subjects by means of striking diagrams, models, charts, and other objective displays. Education itself has utilized traveling exhibits as a means of improvement and progress in teaching, as in the art and industrial art exhibits often circulated by state departments of education and by teachers' associations, for the benefit of local teachers. The influence of museum extension in schools is making itself felt, and a demand for exhibits is being made by rural districts. Thus in Illinois the Illinois Audubon Society has arranged to send out free of charge four traveling libraries, four bird picture collections, and two lantern slide collections, with accompanying lectures. Seeing is believing, and the effectiveness of objective examples is unquestioned as an aid in the learning process, whether with children or with adults.

Relations of Public Museums to Schools. — Related in educational function to the school museum are the activities of general museums of art, science, and natural history in placing their resources at the service of schools, both in elementary and secondary education and in advanced technical education. The value of museums, whether of art or science, in education is a subject which has been receiving ever increasing attention during the past ten years by museum officials in Europe and in America, as may be seen by a reference to the bibliography. In England the large and varied collections of the Victoria and Albert Museum are lent to prominent museums, and to art and other types of schools. The first systematic attempt to bring about a recognition of the educational functions of museums was made in France in 1880, when a commission was appointed by the Minister of Public Instruction to take the necessary steps preparatory to the introduction of arts into schools. In Germany, according to David Murray, " museums are made the basis of instruction, and every subject which can be made intelligible by means of a museum is provided with a teacher." Excellent work is done in this field in the lower grades of public schools in Hamburg through the influence of Dr. A. Lichtmark, director of the Kunsthalle. Other prominent leaders have been George Hirsch, author of *Ideas Concerning the Teaching of Drawing and Professional Art Education* (1887), and Professor Konrad Lange of the University of Königsberg and later of Tübingen. In the United States the question of the relation between museums and schools was not actively considered until the appointment of a Committee on the Utilization of Museums of Art by Schools and Colleges. The direct methods of the committee included formal lectures in museums, or peripatetic conversations, the employment of " docents " or trained guides, and traveling exhibits. Indirect methods include printed lectures, stereopticon illustrations, and photographic reproductions. This system, largely inspired by Mr. M. S. Pritchard, was put into practice at the Boston Museum.

Another impulse toward the use of museums of art was given by the demand in most countries for better schoolroom decorations. Cheap casts, photographs, and lantern slides were placed in the schools, and the possibility of employing greatly improved illustrative materials became apparent. From these collections to museum collections was but a step, and now the stage where the difference between reproductions and originals is being understood has been reached.

The utilization of museums for the study of art has, however, not been so great as in the scientific lessons. The value of specimens in such studies as natural history and physical geography, and of laboratory practice, was encouraged by the Agassiz Association and certain modern textbooks. The new relation between schools and museums has led to the creation of a new office, that of the museum instructor who meets teachers and pupils and shows them the collections or instructs them in such subjects as may be desired. Special rooms have been provided for teachers and pupils for talks by the teacher or instructor; photographs and lantern slides are more widely used and lent out; special children's collections have been arranged, and special lecture courses intended for school pupils are given. Lastly, many museums coöperate actively with the school boards of their communities, and in return for financial support provide for the special relations with the schools.

Museum collections can reach the school child in two ways: exhibits may be taken to the schoolroom, or the pupil may be taken to the museum. Both types of effort are admirably illustrated by work undertaken for the schools by the American Museum of Natural History of New York City. This museum circulates week by week, by messenger, nearly 500 small cases, each containing a unit exhibit illustrating birds, insects, woods, or minerals, which have been studied in a single year by over a million children in 400 different school buildings; and fifty similar cases are rented to the schools of a neighboring city. Besides lectures given at the museum for the general public, a course of illustrated lectures is given for school children who come at stated times in groups with their teachers, forming audiences of 500 and upwards; special lectures are occasionally given by the staff at the request of teachers, who are also allowed to give lectures, illustrated with the museum's lantern slides, to their pupils. A " Children's Room " is provided, with a special instructor in charge, who also gives assistance to classes of children visiting the museum to study exhibits. Formal instruction is carried even further in the Milwaukee Public Museum, where a special teacher appointed by the board of education devotes her time to instructing classes of children coming in regular rotation from the schools. The " children's room," as a feature of museum work, with exhibits with special labels particularly arranged for children, was suggested first perhaps in the U. S. National Museum (*q.v.*) in Washington, where it had, however, no relation to school work; this idea finds its best expression at present in the Children's Museum, Bedford Park, Brooklyn, a branch of the Brooklyn Museum of Arts and Sciences which, while not under the direction of the schools, attempts to relate its work to that of the schools. Here is an institution with exhibits in various divisions of natural history, wholly devoted to children; its aim is to " stimulate the interest of young people," and specifically " to provide collections and working materials . . . to be immediately helpful to teachers who come to the museum with classes for the supplementary study of special subjects pursued in school." In addition to exhibits within the museum, and a limited amount of loan material, a library and reading room are correlated with the exhibits, and the museum provides a lecture room where teachers may present topics to their classes with lantern illustrations, and where lectures will be given by members of the museum's staff on request. The museum of the Buffalo Society of Natural Sciences and the Fairbanks Museum at St. Johnsbury, Vt., have coöperated with the schools very successfully. The Philadelphia Museums, while encouraging systematic visitation by school classes, have distributed from their duplicate materials small exhibits to the schools as permanent teaching collections, a form of coöperation practiced by many other museums.

In Chicago, through the influence of Professor T. C. Chamberlain, the Academy of Sciences since 1909 has arranged one hundred museum loan collections for the use of public and private schools of the city. During 1911 279 loans were made to forty-four schools, and it is estimated that in this way 20,000 children have been reached. Free instruction courses are offered to children, and many schools and classes send representatives who later report at the school. Courses are also arranged for teachers. Thus, the Woman's Club has installed civic and health exhibits; and work of a similar kind is being done by the School of Civics and Philanthropy, Municipal Art League, Council for Museum and Library Extension, and other bodies. In 1912 a bequest of $250,000 was made to the Field Museum for the special purpose of museum extension in the public schools. (See *Science*, Feb. 16, 1912, pp. 261–262.)

The simplest coöperation perhaps has been the encouragement of informal visitation by teachers and pupils whenever the museum promises to be of help in their work; thus the Metropolitan Museum of Art of New York has called the attention of teachers to possible applications of the collections in their language, art, and history instruction; the Carnegie Museum of Pittsburg and other museums have sought to increase informal visitation by means of annual prize essay contests open to school children, with topics based on the collections. Coöperation between public museums and public schools is yet to be developed in many respects: the organization of branch museums comparable to branch libraries, perhaps located in school buildings; the writing of suitable "penny guides" for children which will give surveys of fields of science and other expositions based upon the exhibits; the place of changing exhibits within the museum, correlated with the course of study of the schools; the possibilities of oral instruction within the museum, either in lectures or in peripatetic explanations of exhibits; exhibits and instruction for teachers as distinct from pupils. That this field is one rich in possibilities for school and museum alike is evidenced by the success attending loan exhibits sent to schools, lectures for classes from the schools, and special exhibits, rooms, and museums for children.

Museums and Higher Technical Education. — The place of museums in higher technical education is more striking than in public elementary and secondary education, and especially in the three higher fields of fine arts, the industries, and industrial art. The museum of fine arts which exists in practically every large center of population has often a formal school of art attached, and is nearly always a place of informal art education. The industrial museum is one which displays industrial products; a museum with exhibits representing the whole field of industry, however, would be impossible of realization; some principle for the selection of exhibits is necessary, and this may be historical, technical, or artistic. The exhibits in the National Museum at Washington, for example, illustrating the development of artificial illumination from ancient lamps to electricity, or the evolution of firearms, offer interesting historical data and suggest the significance for history of well-organized exhibits illustrating the industry of the past. Collections made for technical purposes are those which seek to improve industry in a limited field by more or less inclusive exhibits of materials, tools, machines, methods, and products. Finally, industrial objects may be selected for exhibition because of artistic rather than technical merit; such collections form an industrial art museum as distinguished from the industrial museum in which technical interest predominates. The industrial museum aims to increase technical proficiency in industry; the industrial art museum, to increase the element of beauty in industrial products. The relation of museum collections in fine art, industrial art, and industrial technique to education in these fields is obvious enough. Concrete examples of the best man has hitherto done are the necessary stimulus and basis to further progress.

Europe has appreciated this better than America up to the present. There is scarcely an industrial center in Europe but has its collections intended to improve general taste, as with us, but also used specifically to aid workers in fine arts and increase the skill of the artisan and the beauty of his useful product. A city like Leipzig, for example, has the following museums: City Museum of Graphic Arts, Industrial Art Museum, with collections in metal, wood, ceramics, textiles, etc., Museum of the German Book Trade, besides two historical museums, the university collections and certain others. Düsseldorf, art and industrial center, has the Fine Art Collections of the Royal Art Academy, the Industrial Art Museum, which is controlled by an industrial association, and an art hall for exhibitions. In Dresden there are the Royal Collections for Art and Science, and the Royal Museum of Industrial Art, connected with the Royal Academy of Industrial Art, besides many minor collections. Chemnitz has the Industrial Museum of the Artisans' Association, with a collection of 9000 objects "to advance the skill of workers," and a city collection of models managed by the Industrial Union and aided by a grant from the city "to advance local industry especially in regard to artistic taste"; both exhibits represent local industries. Crefeld has a collection of the Association for the Advancement of the Textile Industry, started in 1902, which shortly had over 25,000 samples illustrating carpets, upholstery, modern silks, etc., and receives large accessions each year. One might cite the large museums and collections of Berlin, Stuttgart, and Munich, representing local and national industries; the example of the smaller centers, however, illustrates even better the wide diffusion of the museum in the system of art and industrial education. The Bremen commercial collections merit the motto: "Here learn how

Bremen prepares her sons for world commerce." Museums indeed form one absolutely essential element in the great German organization for industrial progress. Not only do the technical and art schools depend upon the museum collections, with which they usually stand in close connection, but the individual artisan works within the museum and takes out drawing plates, objects, etc., for study. In Düsseldorf, for example, the Industrial Art Museum loaned 200,000 illustrations and 64,000 objects in the first twenty years of its existence.

In France, Switzerland, Italy, and England one finds that museum collections are similarly utilized in higher technical education. The example of England is suggestive, particularly in two respects, first in the large number of local museums, and second in their close relationship to the great Victoria and Albert Museum in London. This relationship is evidenced especially by the very efficient loaning service maintained by the museum in London, and similarly by the Dublin Museum, which send out selected exhibits to the local and provincial museums, to educational exhibitions, and, what is more significant, to art and technical schools, "as examples likely to be useful to their classes in which training in art crafts is given." These loan collections are veritable traveling museums which reach every industrial center in Great Britain.

In the United States natural history and art museums have been organized widely, and have reacted upon science and art teaching. The industrial and industrial art museums, however, are thus far few in number. Industrial art objects find a place in many art museums, however, as in the architectural, woodcarving, glass, and other sections of the Metropolitan Museum of New York; and industrial collections are to be found in certain general museums, as the National Museum at Washington. The best American example of an industrial art collection is perhaps the Pennsylvania Museum and School of Industrial Art, Philadelphia. This institution, organized just after the Centennial Exposition, maintains significant collections in fine arts and particularly in industrial arts, with departments of numismatics, textiles, goldsmith's work, oriental pottery, American pottery, arms, musical instruments, sculpture, furniture, prints, philately; it also conducts an important School of industrial arts, which includes a school of design and a textile school, the latter, one of the leading American schools of textile technology. Another growing industrial art collection is the Museum of the Arts of Decoration of the Cooper Union, New York City. The United States will need a great museum of industrial art alongside of every great industrial school, and industrial and industrial art collections in every industrial center if we are seriously to use education for technical and artistic progress. B. R. A. and H. W. K.

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MUSIC AND MUSICAL TERMS. — Whenever and wherever music has been included in academic curricula, rhythm and harmony have been the main subjects of study. Counterpoint was at first included under the general term "harmony," but since the rise of the modern conception of harmony, counterpoint has been recognized as a distinct subject of study. Rhythm, in its broader sense, has almost vanished as a specific study, but its narrow, mechanically conceived metric phase is included in the study of *form.* Until within a very few years the only academic studies have been harmony and counterpoint, pursued, generally, in the order named. This is an anomaly when we stop to consider the relation of melody to harmony, and note the fact that the modern chordal system is the outgrowth of a highly developed melodic imagination embodied in counterpoint. Strictly speaking, therefore, there should be no separate study of these two eternally wedded elements of music; but out of a free melodic development of harmony, in its legitimate signification as tonality, should be evolved æsthetically significant harmonic backgrounds and colorings of interval and chord masses.

The following condensed treatment of the three subjects, harmony, counterpoint, and rhythm, is an effort to explain the general nature and essential elements, and at the same time outline the general drift of their historic development.

Harmony. — Harmony, broadly conceived, covers all synchronous and progressive or melodic tonal relations. In a restricted use it means the structure and relation of chords and intervals.

The history of harmony is the history of the development of music, inasmuch as all forms of music are based on harmony in its broad and essential meaning. Archæological research has brought to light many facts concerning ancient instruments which give wing to the imagination, and induce the belief that harmony, in its narrow meaning of synchronous intervals, was known and practiced before recorded history recognizes it. This belief finds corroboration in ethnological researches, which make clear the fact that all stages of human development are represented by human beings to-day, and that the most primitive of these peoples not only sing in parts, but in some instances order their music in accordance with modern tonic tonality.

The highest expression of the conception of harmony as the simultaneous sounding of tones, however, could not be attained until its deeper and broader significance was discovered and wrought out in a conscious application of the tonic principle of tonality. Many of the most ancient folk melodies, untouched by theoretical or ecclesiastical thought, reveal this principle as at least subconsciously operative in the human mind. A large mass of melodic material makes it certain that this principle was the essential force in the structure of the folk music that arose from the effort to give expression to the individual and social spirit, long before and throughout the periods when the theoretical musicians were blindly searching for a free and unlimited means for musical expression of the human spirit.

From whatever source the Greeks may have derived their conception of harmony (*harmonike*), historically they furnished the primary harmonic system upon which rested the first period of music as a consciously developed art. Through the Christian Church the modern world inherited the diatonic tonality of the Greek system, with its various species. To this were added, at a later period, chromatic intervals as embellishments, but not as integral units of a definite chromatic tonality, as in the Greek system. With the exception of many of the genuine folk songs and dance tunes, and the dawning musical drama of the latter part of the sixteenth century, this harmonic system of tones or modes furnished sufficient material for the larger part of the monodic and contrapuntal music, secular and sacred, vocal and instrumental, of the first Christian period, including the marvelously complex and beautiful works of Orlando Lasso and Palestrina. Such a system, however, was not comprehensive enough to furnish the human spirit with adequate material to meet the demands of its awakened and expanding aspirations for higher forms of musical expression. Still further, dependent upon language for its coherency, this tonal system did not possess an inherent principle capable of crystallizing into a well organized and independent art the tonal material and relationships revealed and suggested by the contrapuntal polyphony of the period.

During the latter part of the sixteenth century the tonic principle, which had been embodied in many of the genuine folk songs and dance tunes of the modal period, and which had sporadically come to light in contrapuntal music, finally broke the shackles of the mathematical determination of intervals, received definite recognition, and assumed its rightful dominion in the ordering of harmony and melody. This tonic principle gradually developed a definite and primary harmonic tonality, the *diatonic*, involving the three primary harmonies of *tonic*, *dominant*, and *subdominant*, together with a corresponding system of harmonic units, called *chords*. Here, too, the term "harmony" covers two distinct meanings: the progressive conception involved in tonality, and the static conception enbodied in the chord, and in the interval formed by two synchronous tones. The system of pitches necessary to the expression of tonality was called, as in the Grecian and ecclesiastical tonalities, a *key*, each key system being named by the root pitch of the tonic chord. Two distinct species of diatonic tonality, called major and minor modes, gradually crystallized, adding new and extremely effective harmonic material.

An embryonic conception of chromatic tonality arose from experiments in modulation to nearly related keys. Owing, however, to the pure tuning of the instrument used in the period preceding Bach, the number of key tones available for modulation was limited almost exclusively to those of the dominant and subdominant, with their so-called relative minors based upon the sixth tone of each major key. With the final establishment of the equally tempered scale of keyed instruments, the way was open for the application of the tonic principle to the complete development of a harmonic unity of diatonic keys in a definite tonality, the *chromatic*, with its system of chromatic keys, chords, and cadences. This larger horizon stimulated and greatly enriched harmonic imagination, since chromatic intervals no longer served as mere melodic embellishments, but became harmonic units of chromatic tonality, and their expressive significance and capacity were therefore enormously enhanced. As a result, chromatic melody assumed a new and highly significant rôle in the development of all types of music, but especially of the dramatic.

Diatonic and chromatic tonality furnished, almost exclusively, the harmonic and melodic material for the monophonic and contrapuntal music of the sixteenth to the first half of the nineteenth century, including the greater number of the works of Bach, Handel, Haydn, Mozart, and the early part of the Beethoven period. Rich as this mine of harmonic and melodic material proved to be, it did not measure up to the demands of the restless spirit of the latter part of the nineteenth century. In this period of storm and stress and feverish search for more efficient means of musical expression the tonic principle proved equal to all demands, and opened a new vein of unlimited harmonic and melodic wealth in an all-inclusive tonality, for which the term *enharmonic* is a legitimate cognomen. . The enharmonic tonality is the all-inclusive harmonic unity of all diatonic and chromatic keys.

In the polyphonic exploiting of tonality, one of the most significant means of expression, vitally characteristic of contrapuntal as distinct from chordal polyphony, is the harmonically individual significance of each melody. In pure counterpoint the application of this principle of harmonic individuality in respect to each melody produces the impression of the compounding of harmonies. In diatonic, or even chromatic tonality, this harmonic individuality concerns itself only with the simultaneous defining of different harmonies, or chords, of the same or related keys; but in the enharmonic tonality two or more melodies may simultaneously move in two or more diatonic or chromatic keys. The revelation of this inexhaustible source of harmonic and melodic material opened an infinite field for monodic invention, and revealed an entirely new basis for contrapuntal imagination. Composers have not been slow in exploring this mine, and their labors have issued in many masterpieces of musical art born of the noblest and purest spiritual aspirations and inspirations, and also in some voluptuously sensual aural orgies that rival the wildest dreams of Bacchanalian revels and debaucheries. And the end is not yet.

The history of harmony, in its broad and legitimate sense, shows clearly that the development of the consciousness of tonality is the direct result of the ever-increasing demands for significant melody. In the Grecian and early Christian periods, the units of thought were intervals conceived, in a sense, horizontally. Musical thought was concerned with only one dimension. Expressive power was gained by means of the character, the color, of the intervals, and relatively few were, or could be, made use of, even if the quarter tones be included. This monodic mode of expression sufficed, since, in the main, music had no real independent existence, and melody was essentially speech inflection tonally defined. Cohesion of melodic material really centered in language, and the æsthetic character of the poetry. The result of the efforts at polyphonic expression immediately established a harmonic conception of the interval in two dimensions — longitudinal (melodic) and vertical (synchronistic) — moving simultaneously.

Through this process coherency began to appear as a definite and purely musical fact, music began to break away from the limitations imposed by language and to assume an individual existence and character. As a result the development of instrumental or pure music became possible.

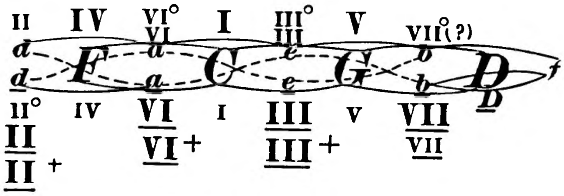
Pushed to its logical conclusion, the synchronous conception of intervals revealed the fact that the chord is not a mere aggregation of such intervals, but is a definite harmonic entity formed, primarily, of a *root,* or center of unity (thus representing, like the prime pitch of the individual tone, the tonic principle); a *fifth,* or root-defining interval, and a *third,* or mode-defining interval. The recognition of this pure chord unit and its progressive orderings necessarily led to the consciousness of a third dimension embodied in pure harmonic tonality. Thus melody enlarged its expressive scope by a threefold harmonic significance, and attained to a principle of cohesion that finally wrought out the absolute individuality of music as an art having its own significant power of expression, and no longer dependent upon either the dance or poetry to define its solidarity, or to make clear its message.

Since in all times the roots of art draw their sustenance from the eternal mental and spiritual needs of humanity, history is ever repeating itself in art, as in all other modes of thought. This repetition is never a copy, however; but is manifested in new forms, under varying conditions, meeting the present conceptions of mental and spiritual nature and aspirations. This is seen in the history of music. Notwithstanding the enormous amount of harmonic and melodic material included in diatonic, chromatic, and enharmonic tonalities, in keeping with the ultra-impressionistic spirit of all modern art, musicians are not wanting who find no satisfaction in the material at hand. Even the alleged whole tone scales and melódic phrases are beginning to pale, and the quarter tone as an element of harmonic and melodic coloring and significance is being revived and experimentally exploited by a few radical musicians. The demand by the few for more significant means of expression is no proof, however, that the present melodic and harmonic material is inadequate. It may possibly be a sign of failure to perceive the potentialities of present means, or a witness to the absence of the "open vision," of the power to see through the veil of sensuous tone and discover and mold significant melody, rhythm, and harmony into pure and noble embodiments of the real spirit of music. Time alone can determine whether the employment of the new-old material shall issue in rarer and more beautiful "temples never built at all, and therefore built forever"; but history would seem to prophesy failure, and for the same inherent reasons that obtained in Grecian efforts based upon like means.

Harmonic Terms. — *Tonality.* — In general, any specific system of intervals, or chords, or harmonies constituting the unital basis of melody. In modern music, a specific harmonic unit based upon a real tonic principle. Tonality is essentially fluidic in nature, involving, like the line, progress of thought; whereas, the tone or the chord is static in its primary character. Tonality is of three orders:—

(*a*) *Diatonic,* — the harmonic unity involving the primary harmonies of *tonic* (*I*), *dominant* (*V*), and *subdominant* (*IV*), in both major and minor modes, and their derivatives, *supertonic* (*II*), *submediant* (*VI*), *mediant* (*III*) of the major mode, and *diminished* and *flat supertonic* (*II*), *flat submediant* (*VI*), *flat mediant* (*III*), and *flat subtonic* (*VII*) of the minor mode.

The following diagram of the diatonic tonality of C makes the chordal and harmonic content clear. A line under a figure or letter indicates a flat ($\underline{\text{d}}$ = d-flat, $\underline{\text{II}}$ = II-flat); and over a figure or letter, a sharp ($\overline{\text{c}}$ = c-sharp, $\overline{\text{IV}}$ = IV-sharp).



(*b*) *Chromatic,* — the harmonic unity of the diatonic *keys* of *tonic, dominant, subdominant, mediant, supertonic,* and *submediant* tones of the major mode, and *tonic, dominant, subdominant, flat supertonic, flat mediant, flat submediant,* and *flat subtonic* tones of the minor modes.

(*c*) *Enharmonic,* — the all-inclusive unity of all diatonic and chromatic tonalities.

Chord. — Harmonic unity of three factors, root (1), color (3), and definer of root (5).

Chords are (*a*) *simple* — major and minor triads: (*b*) *complex* — (*i*) augmented and diminished triads, $c\ e\ \overline{g}$ $c.\ \underline{e}.\ g.$ (*ii*) all septachords and (*iii*) nonachords; (*c*) *compound* — all chord forms having two well-defined roots, although one may harmonically predominate, as in the major diminished septachord, $\underline{e}\ g\ a\ \overline{c}$, or nonachord, $\underline{e}\ g\ a\ \overline{c}\ \underline{b}$. where $\underline{e}$ and *a* are roots whose center of progression is the chord of *d*.

The superimposing of chords results in (1) *compound harmonies,* (2) retardation of harmonic progression, or (3) the simultaneous progression of two different harmonic series.

Interval. — The harmonic unity of any two tones: the relation, synchronous or progressive, of any two tones. Intervals are classified (1) according to (*a*) the number of contiguous degrees involved — *primes, seconds, thirds, sixths,* etc.; (*b*) the character of the interval — *perfect, major, minor, augmented, diminished.* (2) As (*a*) consonant — *perfect fifths,* and *octaves,* and *major* and *minor thirds* and *sixths;* (*b*) dissonant — *seconds, fourths, ninths*, and all augmented and diminished intervals.

Key. — The system of tones involved in tonality, — diatonic, chromatic, or enharmonic. The key is named by the root tone of the tonic chord — key of *D major, D minor*, etc.

Scale. — The degree-wise ordering of the tones, diatonic or chromatic, of a key from any given point, usually the key tone, up or down to the octave.

Diatonic tonality includes sixteen, and chromatic tonality a very much larger number of possible diatonic scales.

The chromatic scale consists of the following incidents — $1\ \overline{1}\ 2\ \overline{2}\ 3\ 4\ \overline{4}\ 5\ \underline{5}\ 6\ \underline{7}\ 7$, in the major mode; and of $1\ \underline{2}\ 2\ \underline{3}\ 3\ 4\ \overline{4}\ 5\ \underline{6}\ 6\ \underline{7}\ 7$, in the minor modes.

Counterpoint. — The term "counterpoint" (*contrapunctus*) had its origin in an early system of representing melodic movements by means of points, and therefore literally signifies point against point (*punctus contra punctum*). In general, counterpoint is a species of musical writing resulting from the weaving together of two or more individually significant melodies into a harmonic unit having definite design and form. *Polyphonic* (many-voiced) singing is known to exist among the most primitive peoples of the present age, such as the Bushmen of Australia. This fact furnishes some basis for believing that part singing may have been practiced long before written history takes note of it, but there are no records of a conscious effort to develop polyphonic art until about the eighth or ninth century of the Christian era. The development of a higher and more complex inner life, together with an expanding apprehension of the solidarity of humanity, could not find adequate art representation in the pure monody of Greece or in the early Christian period, notwithstanding all the subtle and complex modes of enhancing its æsthetic and spiritual significance. The demand for a more deeply expressive, more comprehensive, more fully organized form of an art that touches so strongly the hidden secrets of the human mind and heart led to the development of *polyphonic* and *polyodic* music.

The earliest attempts at polyphony resulted in one or more voices singing a more or less exact repetition of a given melody, called the *cantus*, a fourth below or fifth above, with cadences on the unison or octave. The essential progress of the accompanying voices being parallel to the cantus, no real melodic individuality could result. This seemingly barren type of counterpoint was not, however, without a certain æsthetic significance quite in keeping with the austere and icy character of monastic and religious life. Melodic individuality and significance in the accompanying voices became possible when the principle of contrary motion in respect to the cantus began to govern the progression of the accompanying melodies. The resulting synchronistic intervals were the fifth and octave. This type of polyphonic music was called *descant* (*discantus*). The ungainly skipping nature and utter insipidity of the melodic succession of intervals resulting from this mode of descant led to the improvised or artistically designed filling in of certain skips according to laws governing both melodic progression and rhythmical proportions, and the point for point (*cantus planus*) type of counterpoint was supplanted by the more interesting and artistic species of figured counterpoint.

The development of this species of writing finally broke through the restrictions imposed by a false mathematical determination of intervals, and established the intervals of the third and sixth as effective musical material, whether in the form of melodic progression or quasi chord masses. Thought and imagination thus liberated wrought out a higher degree of melodic and rhythmic individuality and significance in both the canti and the accompanying voices, and a pure contrapuntal polyphony was the final outcome. The advent of this free and pure contrapuntal type of music marked the beginning of the choral epoch, one of the most prolific and glorious periods in the history of music: an epoch which included the works of Palestrina and Bach. Notwithstanding the enormous increase in the power and broader scope of musical imagination and æsthetic expression resulting from the use of the richer intervallic coloring and rhythmic life in the ordering of melodies, a purely musical cohesion did not exist. The necessity for it, however, did exist in the very nature of human thought, and the next epoch registers the appearance and application of the primary principles of musical coherence and unity, and a more highly organized and expressive type of form.

The first principle to appear was imitation. Somewhere some one hit upon the device of making portions, or the whole, of the principal melody accompany itself. In one method of writing the second voice begins the original melody when the first voice reaches a certain point in the *cantus*. This distinct species of contrapuntal polyphony is called the *canon*. The well-known Round, *Scotland's Burning*, is an illustration. Canons are termed *strict*, if the answering voice repeats each interval exactly as in the *cantus*, or *free*, if it varies in any degree the nature of the answering intervals. Canons are also designated as *canon at the unison, octave, second*, etc., according as the answering voice begins at the interval of the unison, octave, or second from the first tone of the cantus.

The following types of complex canon were eventually evolved: (1) *Canon* by *inversion* — the second voice answering the upward progressions in the cantus by downward movements, and vice versa. (2) The *crab canon* —

the second voice singing the cantus backwards. (3) *Canon* by *augmentation* — the second voice singing the melody in notes double the length of the cantus. (4) *Canon* by *diminution* — the second voice repeating the cantus in notes of half the value. Repetition rather than true imitation is the essential characteristic of this type of polyphony, but in the *free canon* the element of variation approaches more nearly the spirit of the higher type of imitation.

Through the increasing influence of the folk song, the folk dance, and the musical drama, and the adoption of the tonic tonality, with its major and minor modes, the fundamental principles of form were evolved, and instrumental or pure music attained its freedom. From this period, polyphonic thought in both vocal and pure music developed in the direction, (1) of the pure contrapuntal type, (2) of the chordal or harmonic type. Apart from dramatic music and the pure song, the dominating idiom of musical thought in this contrapuntal and choral epoch was the fugue and fugal and canonic imitation. This species of musical art was the product of the canonic type plus a demand for greater unity through well-defined tonality and logically organized form. It used the principle of the cantus, but in the form of a short theme. It employed the repetitional method of imitation, but developed a high species of *variation* in the imitating voices. It molded its forms along lines derived from the folk song and the folk dance, but with a freedom that made possible the embodiment of the noblest lyrical and even dramatic imagination.

The elements of the fugue are (1) the *theme* (*dux*); (2) the answer (*comes*) — the repetition of the theme by the second voice in the dominant key (later in other keys), either strictly, called the *real fugue*, or in a modified form, called the *tonal fugue;* (3) the *counter subject* — the contrapuntal melody sung by the first voice as an accompaniment to the *answer;* (4) the *episode*— a free treatment, in fugal and canonic imitation of various types, of some figure or phrase of the theme, binding together the several parts and serving as contrasts to the sections in which strict imitations of the theme obtain; (5) *the stretto* (pressing together), in which the imitative repetitions of the second voice begin before the complete ending, and at points nearer and nearer to the beginning of the theme.

The era of the fugue and canon culminated in the works of the acknowledged greatest musical genius the world has yet known, Johann Sebastian Bach.

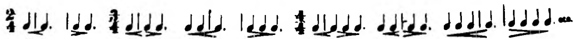
Overlapping, but essentially beginning with the establishment of the tonic principle and the domination of the chord mass in place of the simple interval as the essential unit of thought in tonality, pure counterpoint has been ordered in accordance with the two distinct governing principles of (1) *tonality*, whether *modal* (ecclesiastical) or *tonic* (modern tonality), and (2) the *chord*. In the first and purest type of counterpoint each melody moves freely in the tonality, untrammeled by any necessity for defining, in conjunction with the other voices, a specific series of chords, and unfettered by any demand that its cadences shall coincide with those of accompanying voices, except at the close of important sections. In this species the synchronous masses are not chordal in the strict harmonic sense; but masses of synchronous intervals, intervallic colors, suggesting, it may be, two or more harmonies or chords. In the second type of counterpoint all the voices, while real and individual melodies, move with reference to defining a specific chordal scheme. In this second type the synchronous masses are clearly defined chord units, either simple or complex. These two types of polyphonic music are distinguished by the fact that all the voices are concerned with melodies of equal significance, and are, therefore, strictly contrapuntal.

A third and important species of polyphonic music is one in which the voices are concerned mainly, if not solely, with the function of defining chord masses and enriching them with intervallic color, sonority, and massiveness. Chord masses thus conceived may serve as the principal means of expression; and melody, in a degree, may be fragmentary and not definitely organized, or all chords may be used as means for enhancing the expressive significance of one or more important melodies. This is the genius of what is termed the monodic or monophonic type of composition, although it may be polyphonic as to the fact of many voices. In this type of polyphony the voice progressions do not pretend to assume melodic significance, as in pure counterpoint; in fact, the various voices may be, and often are, without melodic significance. These three types of polyphonic thought are all employed as means for enhancing the æsthetic import of the music of all writers, from the pure lyrical and dramatic contrapuntist, Johann Sebastian Bach, down to Richard Strauss and Claude Debussy, the ultra-impressionist tone painters of the present time.

Rhythm. — In all modes of thought, all modes of imaging a consciousness of ideas or experiences, the factors of duration, or quantity, and intensity, or stress, are necessary conditions for determining æsthetic form and significance. Proportion in respect to duration, or dynamic intensity, arising from the æsthetic impressions or from the nature of the elements of expression,— for instance, sound in language, tone in music, — is the essence of that idea which, following the Greeks, we call Rhythm. A rhythmic idea appears whenever a grouping or ordered sequence of proportions is defined.

In music the melody of folk songs and church canti followed the proportionate durations governing the sounds of language until the efforts at combining melodies of varying rhythmic design made it necessary to adopt some principle of order and unity in respect to the number of tonal durations that should be sung to the tones of the cantus by the discanting voices. From these efforts arose what was called *mensural music*, based upon two primary ratios — the perfect, three is to one, ♩♩♩ = 𝅝 and the imperfect, two is to one ♩♩ = 𝅝

Under the influence of counterpoint, the dance and instrumental music, the gradual development and organization of complicated rhythms led to the adoption of the accentual principle of metric rhythm as a means for defining the progress of the various voices. The elements of metric rhythm are (1) units of a given duration, called beats; and (2) varying intensities in respect to the thought content of such units. A measure, therefore, is a rhythmic entity involving the relation of a definite number of beats of like duration, but of differing intensities. Measures may vary (1) in the number of intensities or beats, *i.e.* two, three, four, beat measure, etc.; (2) in the order of the intensities, as in the following illustrations, where the quarter note represents a beat of given duration, and the bar the point of greatest intensity.



To meet the exigencies of free poetic imagination and to avoid monotony resulting from a long series of like kinds or orders of measure, there are in music varying modes of treating metric conceptions.

1. The most common metric variation results from the use in a given metric series of a variety of forms (orders of intensities of measure); that is, while the general unit of duration from crest to crest of the greater intensities remains comparatively constant, the less significant thought units, the lesser intensities, may freely vary in their relations to the strong intensity, thus resulting in a series of changing forms of measure.

2. A second mode of variation (Fig. 1) arises from the sudden changing of the strong intensity from its normal position in the series, resulting in what is known as *syncopation*. In polyphonic music, syncopation practically arises from superimposing like meters, starting at different periods, a species of rhythmic dissonance. A modern term for the extreme use of this effect is Ragtime, to which all great writers must plead guilty.

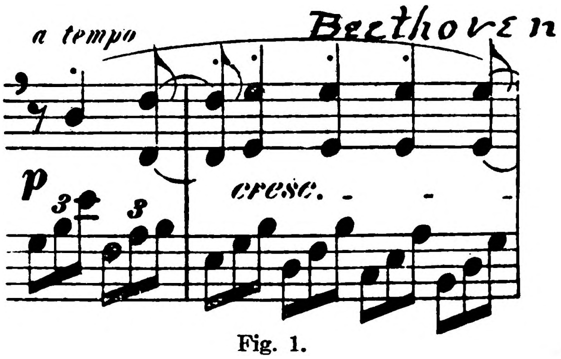


Fig. 1.

3. A third and very effective mode of rhythmic treatment arises from combining different measures. That is, while one melody moves in, say, three-beat measure, the second may be moving in two-beat, and a third in four-beat measure, a species of rhythmic harmony. In the following illustration (Fig. 2) from Schumann the melody is in three-beat and the accompaniment in two-beat measure.

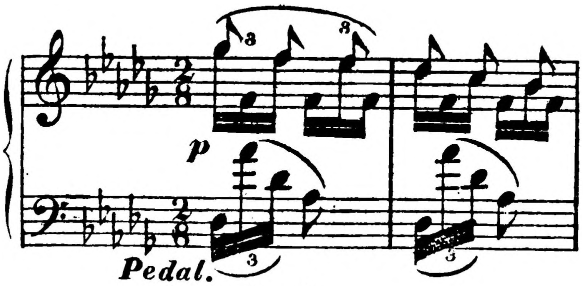


Fig. 2.

(4) The fourth form of metric variation is the product of a series of varying kinds of measures. This species of rhythmic variation may be accomplished in different ways: (*a*) The measure may change in respect to the number of beats without changing the limit of duration between the points of greater intensity, as in the following passage from Schumann (Fig. 3), where *a*, the primary two-beat measure of the first strain, is followed by *b*, a three-beat measure, the metric scheme of the second strain; (*b*) A beat may be added or subtracted, thus changing not merely the *kind* but the real *duration* of the measure, as in the passage from MacDowell on the following page. (Fig. 4.)

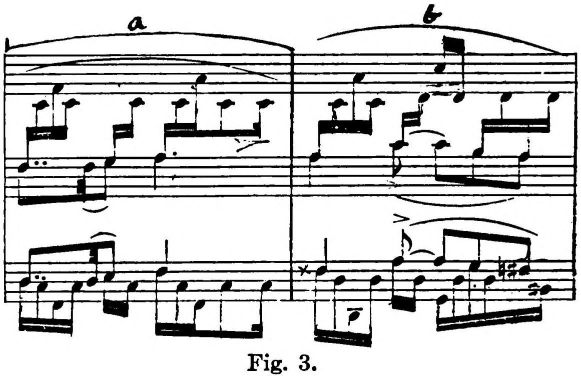


Fig. 3.

This rhythmic variation is characteristic of many folk songs, showing that it is a primitive form. The following fifteenth-century chanson is a fine specimen. (Fig. 5.)

(*c*) A third variant, of like nature with the above, is a species of rhythmic augmentation, as in the following passage from Schumann (Fig. 6), where the rhythmic unit *a*, formed by two three-beat measures, is followed by really a

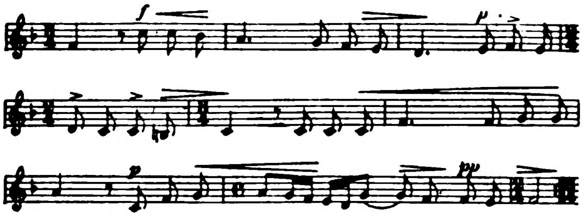


Fig. 5.

one-measure rhythm of three augmented beats, three longs, the quantitative value of which equals the preceding *two-measure* unit.

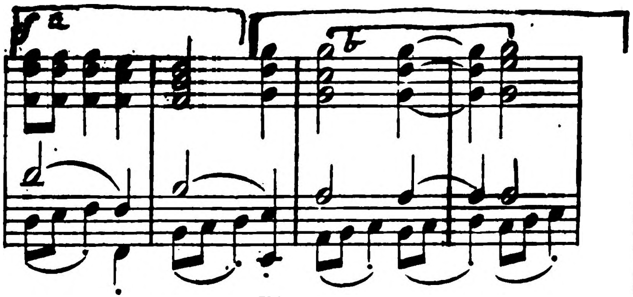


Fig. 6.

The following complicated and effective passage from Brahm's Clarinet Sonata in F minor is interesting, because of the augmentation in two voices that are syncopated in respect to each other. (Fig. 7.)

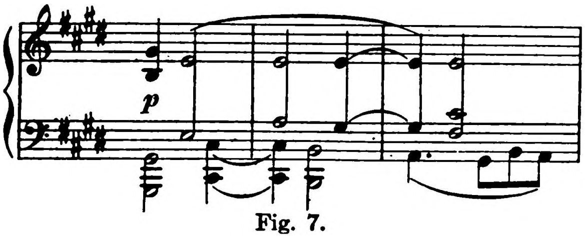


Fig. 7.

In the educational development of rhythm, meter is usually given the first place, as though it were the more important rhythmic factor; quite opposed to this common theoretical notion, however, is the fact that in the real interpretation of both music and poetry meter is far from being the most significant rhythmic conception. Based upon the circumscribed figures of the dance, and serving the purpose mainly of punctuating the lesser units of thought, in the highest lyrical, and especially in dramatic music, the metrical accent is practically lost, swallowed up in the quantitative proportions and the stresses involved in the larger units of musical thought, such as the phrase, and even the motive. As a matter of fact, therefore, quantity (durative mass) and quantitative proportions are the essential elements of rhythmic thought. A very simple illustration will serve to make clear the vitally expressive rhythmic effect of the rhythm of quantity. The following versions of the opening phrase of Beethoven's Sonata, *Opus* 13, do not differ in respect to the number of beats and points of greater intensity. (Fig. 8.)

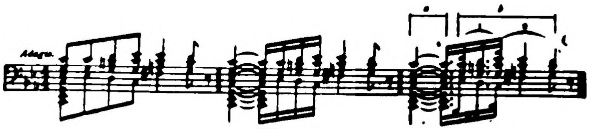


Fig. 8.

Nominally, and as conventionally printed (fig. 4) this phrase is supposed to lie within one measure of four beats, each beat being represented by a quarter note. Practically, the development of the thought requires two points of greater intensity — the first and fifth tones. The beat, therefore, is represented by the eighth note, and the phrase includes two four-beat measures.

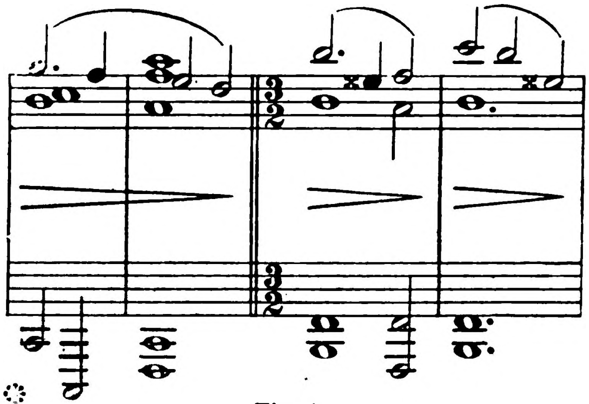


Fig. 4.

In the first version, Beethoven's dramatic idea is entirely lost, because the individuality of the first chord is merged with the second and third chords, forming the opening musical idea. In version two the rhythmic form of the first chord embodies a distinct impression, like, for instance, the first word in *Hence! loathed Melancholy!* But the intensely dramatic force of the opening chord is only realized in the quantitative form of Beethoven's version. Still further, in Beethoven's version the second idea, *b,* is far and away more dramatically expressive by reason of the quantitative proportions, and also because the same means break the thought into two impassioned utterances, b^1 and b^2, the second of which forms the climax.

Educationally, it would seem to follow, as a necessary deduction from historical evolution and the greater significance of quantitative (durative) proportion, that this should be the rhythmic principle first recognized and most assiduously studied. The ordinary method of metric scansion in music based upon the tyranny of mechanical accent (in music represented by the bar) is deadening to the higher and vital conception of the beauty and expressive significance of quantity in music as certainly as in poetry.

It remains to call attention to the fact that rhythm plays as significant a rôle in the harmonic design as it does in the melodic structure. For the understanding and interpretation of a musical work of art it is essential, therefore, that the rhythm of the harmonic background should receive equal consideration with the rhythm of the melodic designs. C. B. C.

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MUSIC IN EDUCATION. — Historical Sketch. — The place of music in popular education has changed with the changing motives that control such education. Three distinct phases may be recognized: the religious, when education was chiefly connected with the Church and the teacher was the priest; the humanitarian, which came with the growth of the democratic influences of the eighteenth century; and the social-economic, as one may call the third phase upon which we are now entering. The rapidly growing complexity of our modern life has been putting greater and greater demands on our whole educational system. The problem of the modern educator is to discover how to economize time and energy. A new valuation is now going on of all forms of study and exercises that occupy the student's time, aiming to adapt the curriculum to meet the practical requirements of life efficiently. It is natural that such a study as music, which presents so little that can be measured from a practical point of view, should be influenced by this movement.

The Religious Phase: Choir Schools. — Tradition says that choir schools (*schola cantorum*) were instituted at Rome as early as the fourth century (by Pope Silvester I, 314–335) and from 590 they were much emphasized by Gregory I (*q.v.*). At least by the eighth century, if not much earlier, the Western Church had given official sanction to a system of unison melody, commonly known as "Gregorian," though apparently developed from Byzantine and Greek origins, which had attained notable proportions as the artistic vehicle or embodiment of the liturgy. That the Church used music as a means of elevating the people is shown by a saying of Chrodegang of Metz (746–766): "The melodies of the singers shall uplift the people to love of divine things through the inspiration of the words as much as through the tune." From about the twelfth century the Church also became the field within which the art of contrapuntal composition unfolded. This evolution was scholastic, rather than popular. To master it required discipline, such as was possible only under teachers and through study. In the medieval "choir school" the subject of the new Figured Song was now added to that of the Gregorian Plain-Song. The persons thus educated were primarily only adult ecclesiastics, — monks and priests, — but as choirs of men and boys became common, the "choir school" tended to become an institution in which many boys below the age of puberty might be educated to considerable musical proficiency. The study of sacred song was the main object, but, because the boys had to be kept together for several years, other subjects were introduced more or less. Hence the "choir school" often touched the field of general education, but with music highly emphasized. In process of time some of these schools accumulated endowments and became independent institutions. A famous illustration of this is the Thomasschule at Leipzig, which began as an Augustinian monastery school in the thirteenth century, and became a Protestant town school before the middle of the sixteenth. Many others, especially those connected with cathedrals and with certain national courts (*Chapel Royal*), have persisted in some form to the present day. (See CHORISTERS' SCHOOLS; SONG SCHOOLS, in the article on MIDDLE AGES, EDUCATION IN THE.)

Early Methods of Teaching Music. — From the earliest periods two distinct modes of approaching music teaching were presented, one in which the learning was through imitation, teaching by rote, as it is called — and the other where the rudiments of music were taught, and the pupils learned to read from the written signs. In a school ordinance of 1522 at Nördlingen the pupils were to be divided into three sections, of which the two upper ones were to receive instruction in theory and practice, and the last should first be taught the text, and then the tune by ear. The Württemburg church ordinance, 1559, and the Pomeranian, 1563, provided for the practice of singing in elementary schools, but the method was only that of singing by ear; in the Latin schools it was usual to employ the pupils in choirs so that they received regular instruction in music. While the Reformation broke away from the older ecclesiastical music, it stimulated in the chorale even a greater desire to sing. Luther is reported to have said: " A schoolmaster must be able to sing or I take no notice of him." The ordinances drawn up by Melanchthon and Bugenhagen provide for instruction in music, but they deal generally with Latin schools. The School and Church Visitation in Marburg (1628) and Hesse-Darmstadt provided that all children above eight years of age should " attend the public schools and at all times be present at the singing in Church." Duke Ernest the Pious of Gotha (*q.v.*) included singing in the famous *School-method* of 1643, which devoted one of the longest portions of the work to the subject (paragraphs 212–294). It includes suggestions on method and formal instruction in music. At least one hour each day was to be given to it. Two divisions, choral music and figured descant (*Figuralgesang*), were made. The former was taught by ear, phrase by phrase; the latter from notation. The teacher is warned not to weary the pupil with too much theory and troublesome scales. A song book is to be provided for each. Clear and sensible expression should be insisted upon. The earliest pieces were to be sung in four parts (descant, alto, tenor, and bass). The teacher was not provided with an instrument for accompaniment. An ordinance of 1697 for Nuremberg provided that singing should be taught in writing and ciphering schools for church purposes. Comenius (*q.v.*) proposed that the child should be taught singing of a few easy psalms as early as the " mother school." In the elementary school he only recognizes singing for church and religious purposes. Francke's aims in music were similar.

The numerous ordinances of the sixteenth century provide for the teaching of singing, but in all cases the subject matter is religious. In many cases the ordinances appoint the local sexton to teach singing along with the catechism. In fact, many Protestant schools owe their origin to the need of teaching singing for the service of the Church

In England the song school occupied a position a little above the elementary and below the grammar; and while their chief object was to teach the singing necessary for church services, the other common subjects were included.

Erasmus describes the English as a musical and the German as a drunken people, and it has been suggested that the abolition of the training school of song and music that took place with the Reformation and during the reigns of Henry VIII and Edward VI had much to do with changing the musical character of the English people.

It must be noted that the song school was not confined to song; often teaching to play on the organ is included in the description of the song school master. Such was the case at Bosbury in Herefordshire. The schoolmaster was to " bring up the youth in learning and to play the organ." Similar to the song schools in England were the sang schools of Scotland; one in Aberdeen is believed to have existed as early as 1370. While in Scotland especially the sang school seems to have been adopted by the Reformation, the lesser importance that music occupied in the service of the Protestant Church reduced the importance of these schools, so that they have gradually died out.

Gild Schools. — Outside the Church two organizations, the gild schools and the " town musicians," contributed largely to the development of musical education. Of the gilds the most notable example is the extensive circle of gilds organized by the Meistersänger of southern and western Germany from the fourteenth century onward for more than two hundred years. These societies sought to magnify poetry and song as a kind of trade specialty, which was to be cultivated only by passing through a graded system of training and examination that led ultimately to the right to the title "Master." The historic importance of these curious fraternities lay not in the artificial and even ridiculous methods that they often used, but in their number and distribution, with the considerable number of their members. Artistically and pedagogically, the *Meistersänger* movement lacked breadth and insight; but its popular influence was not insignificant. It served to bring into action latent capacities for music as a serious pursuit among the common people, and to dignify the process of education which was involved in that pursuit. Somewhat parallel movements — the so-called " Minstrel Gilds " — occurred in other countries.

Town Musicians. — Associated with these gilds in time, though not always connected with them directly, were numerous efforts to organize in certain communities a body of " town musicians," both singers and players upon instruments, which could be called upon to assist in numerous civic and social functions. Every such organization, when continued long enough to become an institution, demanded more or less of an educational element or basis, which was variously supplied in different cases, sometimes through the town schools. It is difficult to cite any large number of facts under this head, but there is reason to suppose that from the sixteenth century onward a constantly increasing number of towns and villages in Germany, France, and England maintained some communal interest in music, and made some slight communal provision for instruction in it. This tended always to bring the subject of music into organic connection with whatever system of public education was attempted.

The Humanitarian Phase. — The second phase of music teaching was strongly influenced by the humanitarian spirit that so pervaded the democratic movement in the latter part of the eighteenth century. The school, instead of being for the Church, was developing more and more for the people. Hence, reforms in the methods of teaching were many and radical. The desire to give every one attending school the rudiments of a musical education led to the simplifying of notation. Much of the interest that was awakened in popular singing early in the nineteenth century can be traced, in Germany especially, to the revival of interest in liturgics in the Lutheran Church, giving importance to congregational singing. Another motive is that the national school systems that were then being started in the leading countries of Europe gave a value to music as an element in the education of patriotism. The influence of such a reformer as Pestalozzi was felt. Hans Georg Nägeli (*d.* 1836), a music publisher near Zürich, was active in agitating for school music, especially advocating the application of the new methods of Pestalozzi to the subject.

In France, Guillaume Louis Wilhelm (Bocquillon, *d.* 1842), known chiefly by his efforts to promote popular teaching of singing, was made director-general of music in the municipal schools of Paris in 1819. He threw himself into this cause with an enthusiasm which soon produced striking results. Besides the school teaching, he had classes which gave instruction to thousands of pupils, mainly working people; and out of this presently grew the establishment of the Orphéon, the vast organization which has since covered France with singing societies.

The success of Wilhelm's work in France stimulated similar movements in England under Mr. Hullah, who on Feb. 1, 1841, opened at Exeter Hall a school for instruction of schoolmasters of day and Sunday schools, in vocal music, by a system based on Wilhelm's. In twenty years, it is said, over 25,000 persons passed through his classes.

Tonic Sol-fa Method. — A parallel movement in popularizing music in England, which grew to much greater importance, under the lead of Mr. John Curwen, began to attract attention about 1850. It is based on a simplification of musical notation, the staff being discarded and a letter notation being substituted in its place, indicating the relation of the tones in the key. The emphasis of key relationship of the three most important tones in our harmonic system gave the name to the method of Tonic Sol-fa.

Galin-Chevé Method. — A similar method was being developed in France, although not attaining the same importance, under the name of the Galin-Chevé, in which, as in the Tonic Sol-fa, the relationship of the tones in the key was emphasized, only in this case numbers were placed over the notes to indicate this relationship.

Public Class Instruction. — Still more important pedagogically was the change in methods that ensued from passing from the traditional custom of private or individual instruction, which had been in use for generations in most musical subjects, to systematic class instruction, particularly of singing in chorus. This is seen in the widespread interest in choral societies of different sorts that began to attain large proportions during the first half of the nineteenth century in Germany, France, and England. Such enterprises, whether in schools or in communities, stimulated the preparation of special literature, — textbooks for learners, manuals for teachers, graded material for the use of societies, — and tended increasingly to induce many persons to prepare themselves to become instructors, trainers, and leaders. Thus public school music and public choral societies so closely connected in the methods employed gradually became distinct and significant movements.

United States. — The enthusiasm for the popular teaching of music, which was being felt so strongly on the Continent and in England, was not lacking in the United States, Under the lead of Lowell Mason (*q.v.*), who is well called the father of school music in America, work was commenced in Boston that led eventually to the adoption in 1837 of a resolution: " That in the opinion of the school committee it is expedient to try the experiment of introducing vocal music, by public authority, as part of the system of public instruction, into the public schools of this city." Parallel to the school work, like both Wilhelm and Hullah, Mr. Mason started an institution for giving concerts and preparing teachers, known as the Boston Academy of Music, established in 1832. Mr. Mason was strongly influenced by the teaching of Pestalozzi, and avowedly conducted his work on his system of teaching. The example of Boston was soon followed by such cities as Cincinnati and New Orleans, and there has been a steady advance toward the full recognition of music as a school study.

The Social-Economic Phase. — The trend of the third phase in modern popular education, which we have termed " the social-economic," is well illustrated by the tendency to slight or drop music entirely in schools fitting students for the higher institutions of learning.

A glance at the courses of study offered by such institutions in Germany, France, England, or the United States will show that less time is given to music than formerly. Higher education tends to become more specialized, and a subject like music, which shows perhaps less connection with a professional occupation than does any other, now takes a less important position than in schools serving a similar class of people fifty years ago, when the cultural or general education was stronger than the professional or economic.

A second reason influencing the change is the very great development of popular education, making a demand for teachers from the middle and lower classes who necessarily are unable to put very much time on professional training; so that, especially in America, a large proportion of the grade teachers are musically unable to teach the subject. The preparation of these teachers, demanding so much in the line of modern practical subjects like physical training, manual training, drawing, domestic science, and domestic art, tends to leave less and less time to the preparation for teaching music. Along with this same pressure the experiment of attempting to teach everybody sight reading, that was so enthusiastically supported in the middle of the last century, is not giving the expected results. Not only is the necessary drill proving irksome both to teachers and pupils, but the slight mastery gained is not proving of any great musical value in the later experience of the pupil. Hence, the liberal educators are dividing the time given to specific music study with what might be called " appreciation work," the hearing of music performed, since the modern mechanical means for reproducing music prove a very great aid to such work. There is also a distinct tendency to encourage instrumental work in schools, although this is often supplementary to the regular school work. Especially striking is the work done in England by what is known as the " Maidstone Movement," where fully half a million school children of the British Isles are connected with an organization for playing the violin. There is a tendency in the extremely modern schools to shift the emphasis in music from the pure sight reading work of the earlier years to various forms of what might be called creative work. Under the theory that the pupils get the most out of what they make themselves, they are encouraged to make up not only their words but the tunes as well. Finally, while the place of music and the method of its study are changing, and the place it has occupied is being contested by other subjects, yet this very struggle is bringing about a larger view as to its true value in education, and more efficient methods as to its realization.

Methods in School Music. — Methods in music teaching deal with two kinds of activities: (1) What is necessary for producing the music, such as the control of the instrument, or voice, and the understanding of the notation. (2) What is done under the term of " nuance," popularly called " expression," and the slight notation that indicates it. The first may be said to deal with the structure of music, the second with its interpretation. It is obvious that the first application of a method in music will be to produce tones, following which there will be a constant effort toward control for expression. This is especially true for the instrumentalist. Even the voice teacher spends the first few years in what is called " voice-placing," practice for producing a good singing tone, before he does much with song interpretation.

In teaching school music, however, this order of activities is reversed. The voice in most children, through the exercise of speech, is already under wonderful control, so the aim of school music is not to produce professional singers with developed voices, or professional players, but to cultivate a taste for music by good singing and to prepare the individual to aid in the social uses of music, and it is better to commence with rote songs, or singing by imitation. Two things are thus of special importance in school music: (1) the pupil must know how to render many fine songs in order to develop his taste and appreciation; and (2) he must be able to read from notation.

The instrumentalist, by the time he has learned to play, has associated the action necessary to produce the tones with the notes on the staff that represent these tones, so that when he sees the note he can produce the tone. He can thus, unfortunately, especially if he is unmusical, avoid the necessity of thinking music. The mental process of such a person consists in thinking the physical motions necessary to produce the tone called for by the note, but not the tone itself, which he only hears as the result of his action. On the other hand, the singer has no definite movement in his throat that he can associate with a given note on the staff. F and F sharp feel the same to him. The singer is obliged to learn his notation not by connecting it with the actions that produce the tones, but by connecting the notation with the way the tones sound. The first few tones heard tend to establish a key to which all the tones that follow are related, the task of the singer being to associate these tone relationships to the notation that represents them. His mental process, instead of being connected with the physical movement necessary to produce the tone, is a thought process, for he must hear mentally the sound that the note represents before he can produce the tone.

Interpretation. — Learning songs and learning how to sing them expressively in school is largely carried on through imitation, the pupil being required to match or imitate the model tones given as well as the style or way in which the songs are sung. Supporting this work, the thought of the text and the character of the melody are brought home to the student's mind, so that his feeling for the thought and the character of the song aids in getting the quality and rendering desired. Besides this work, vocal habits are developed in the pupil, based on the distinction between the chest and head tones. The former is what the child or youth largely employs in his play, and there is a natural tendency to do the same in music; but when sustained pitch is attempted with this register above B in the middle of the treble staff, the tone becomes hard, and the vocal mechanism strained. The head tone that the child naturally uses when singing above D of the fourth line of the treble staff is clear and sweet. Vocal method in school music is largely concerned in strengthening this upper head tone and developing it downwards. For this reason most teachers agree that scale practice and technical work should commence with the upper part of the voice, with the head tone, bringing this quality down as far as possible and that the lower tone should be sung softly, developing by constant practice an automatic control of the voice. Thus, the first method in school music deals largely with musical interpretation, and consists in: (1) Imitation of a good example. (2) Attention to the thought of the composition, both text and style. (3) Development of clear head tones.

Structure. — Turning now to the second element in learning to read music, the starting point here also lies in imitation. Tone progressions, such as scales or simple songs, are first learned by imitation. These are then sung in connection with their notation, until an association is formed between what is sung and what is seen. Such association is not as simple as it seems, for the notation of music presents three different kinds of tonal relationships: pitch, duration, and metrical grouping. It is through the combination of these three kinds of relationships that the pupil is able to form a concept of the musical movement of his tune. The problem here is essentially the same as that of reading language. From what the notes indicate, the pupil's mind must be capable of forming concepts of the musical movement sufficiently far ahead of what the voice is producing not to interfere with the even flow of the music. Unlike language, the signs and notes that represent these relationships are not grouped into musical units as letters are combined into words standing for the same idea in whatever combination the words may appear; but every musical unit has its own peculiar combination. The music reader must think these musical units by combining the separate relationships that go to make them up. The most complex part of the training, and the one that requires the closest attention in the methods employed, is concerned with the problem of rapid conception of the tune from its notation. A musical child will often make its associations between the appearance of the notes upon the staff and the movement of the music, so that he is able to read music fairly well, without being able to tell definitely the separate intervals of duration and pitch, representing the musical thought.

Key. — The large majority of people, however, need help in associating the position of the tones in the keys with the notes. Such a device we have in the famous *do re mi*, or syllable names, dating back to the eleventh century, and attributed to Guido of Arezzo. This association is made possible when the key is established, the tones of the scale taking on certain characteristics. When, therefore, a certain syllable is always sung to a certain tone in the key, when the sign for a syllable is written, it suggests the relative tone in the key it represents. The principle underlying this use of the syllable names had a revival in France under the leadership of Pierre Galin, a music publisher of the early nineteenth century, who indicated the relationship of tones by numbers. In England John Curwen utilized the sound names attributed to Guido. In the system thus developed, called the "Tonic sol-fa," the fixed pitch representation of the staff was ignored, and the first letter of the syllables, *do, re, mi,* etc., were printed instead of numbers, for example, *d, r, m.* The spacing of these letters indicated the duration of the tones. These letters, like the numbers, drew attention to the relationship of the sounds to be sung, and not to any given pitch, and are evidently a vocalist's notation.

The American methods follow the English usage, and some places even adopt the Tonic sol-fa notation as an introduction to sight-reading; but the ordinary practice is to use the syllable names with the staff notation. This brings about a complexity that does not exist where the syllables are used with the Tonic sol-fa notation, for reading by note requires a student of harmony to determine the proper relative name from the fixed notation that the staff represents, especially in modern music, which tends to be more and more chromatic and makes it difficult to determine what the exact key relationship of a tone is. Another difficulty grows out of the constant use of the Tonic sol-fa names, especially where the syllable names have been too slavishly used. The tendency is to associate the tone to be sung not simply with the sight or sound of the name, but with its actual physical production, so that the pupil is able to sing the tune if he can sing sound names, but is unable to think the tune apart from the names. In order to avoid this difficulty many schools use numbers instead of sound names. The objection to this is that the number names do not lend themselves to good tone production, and when too closely followed this method is open to the same objection as the use of the sound names. The chromatic tendency of modern music above referred to is making these methods less and less effective.

Interval. — Besides thinking of tones in their relation to key, we may think of them as determined by their distance from each other as intervals of seconds, thirds, and fourths having certain common characteristics. When this has been thoroughly grasped, one is enabled to sing these distances by thinking the nature of the interval. Mr. Samuel Cole of the New England Conservatory in his sight singing course has given specific names for each interval. By always using the name with the interval whenever it occurs, associations are formed between the interval character of tones and the name, so that, when the interval name is thought, the tones occur to the mind.

Rhythm. — The teaching of duration and time grouping of tones does not present such a variety in the methods employed. The demand on the pupil, unlike that of thinking pitch relations, is identical for both singer and player. A few fundamental differences in tone lengths are used over and over, whatever the key, although confusion is caused to young students by changes in the note used to represent the beat. This difficulty is being reduced, there being a tendency among publishers to use uniformly a quarter note to represent the beat in simple time. Besides beating the time, other physical movements for strengthening the feeling for pulse in music are being employed in a more varied way.

In Europe much interest has been awakened by the work of M. Jacques Dalcroze, who has developed a remarkable feeling for rhythmic character through dancing and gesture. Movements of the march and folk dance are advocated for developing rhythmic feeling as a support for musical work.

Present Procedure. — The pressure of more and more studies in the school is tending to lessen the time given to singing. A fair average allotted to this subject is one hour a week, sometimes given in two half hours, sometimes in fifteen-minute periods. This hour is often supplemented by another period of music work and general exercises. The music study period generally commences with some breathing exercises, followed by scale and vocal practice. Then technical matter pertaining to notation is followed by reading new music or exercises, and the lesson ends with a review of familiar songs.

In the first grade learning songs by imitation, or " rote singing," as it is called, is largely emphasized, and in some schools this is carried on in diminishing extent through the grades. This makes it possible to introduce a great deal of excellent music, which might otherwise be too difficult to read. On the other hand, those schools employing sight reading do little rote work after the first grade, paying much more attention to the singing of exercises intended to improve sight reading. This procedure reduces the artistic musical material used, but tends to increase the proficiency in reading. In either case, much depends upon the amount of individual work demanded from the pupils. The great difficulty in accomplishing any thorough teaching along ordinary lines lies in the fact that music is universally taught collectively, thus reducing the individual responsibility to a minimum, so that students can go through eight years of grade work, and at the end be unable to give the simplest description of what they have done.

New Tendencies. — The new trend in modern education is bringing about a decided change in the attitude toward the popular teaching of music. This change in aim puts the emphasis not so much on what is taught as on what the pupil can do with what he is taught. The point of interest is the pupil rather than the subject. Under this new influence the teacher aims to make the tone quality, the dynamics, the pronunciation, and the musical form, both as to pitch and rhythm, grow out of one central thought, — the expression of the feeling suggested by the words of the song. The child must sing it in a way to show that he realizes the significance of what he does.

But this is not all; the child must not only make the musical thought of another his own, but he must have experience in expressing his own poetic and musical thought, not that in so doing he can express anything of value for others, but for the sake of the musical development both in thought and taste that such practice brings about. It is parallel to theme work in the teaching of the mother tongue. This attitude toward music treats it more as a language, and seeks to make the form expressive of the feeling. In making a melody fit the words of a song the child is constantly led by the teacher to observe the relationship between the music and the text. Such effort on the part of the pupil brings about the most searching observation and thought with reference to the song he is producing, and when such song making is the collective effort of the whole class, different members offering their versions of the wording and thought of their couplets and their melodic expression, a much more intensive exercise of æsthetic faculties and discriminative thought is brought about than ordinarily takes place by the old methods.

Thus the new methods seek to develop the poetic, imaginative, and discriminative power of the pupil in his relation to music, laying the basis for musical appreciation, which after all is the most important use to which the pupils in our public schools will put their musical education.

Training for Teachers. — Unfortunately for music in American schools, the normal schools have been unable to give the necessary training, five hours a week for half a year being the average time allowed to the subject. When this short amount of time is divided between the development of the student's own musical capacity and her training as a teacher, the inadequacy of this work will be comprehended. To meet this need the larger publishing houses are conducting summer schools for training music supervisors and grade teachers, offering courses running in some cases for three seasons. The danger in this work has been that methods advocated have been too closely allied with the particular publications of the house conducting the school. In spite of this, improvements in methods and in material have been due to the far-sighted enterprise of publishing houses rather than to the school authorities. C. H. F.

Music Schools and Conservatories. — The name Conservatory was first applied to orphan asylums where children who where particularly fitted by virtue of superior talent received a thorough musical education.

Italy. — The oldest known conservatories were founded in Naples during the sixteenth century. Four of these were combined by order of King Murat (1808) into the now existing conservatory San Pietro a Majelle. The last director was Guiseppe Martucci (died 1910).

Rome. — Conservatory of St. Cecilia, founded in 1566, subsidized by the government. Perhaps the most famous Italian music school. Tuition sixty lire a year.

Palermo. — Royal Conservatory, founded in 1615. Has at present twenty teachers and about 150 students.

Venice. — Liceo Benedetto Marcello became a municipal institution in 1877. Present director E. Wolf Ferrari. Tuition very moderate, from 20 to 100 lire a year.

France. — Paris. — Conservatoire National de Musique (1795) is perhaps the best organized music school in the world, and its standards are therefore of the very highest. Among the instructors have been France's finest musicians, — Cherubine, Auber, Thomas, Dubois, Fauré, Widor, Lavignac, Lasalle, Rose Caron, Chevillard, Guilmant, Risler, etc. The age of admission is from nine to twenty-six. There are about 800 students and eighty-five instructors. The highest honor obtainable is the "grand Prix de Rome." Some of those receiving this distinction were Halévy, 1819, Berlioz, 1830, Gounod, 1839, Bizet, 1857, Massenet, 1863, Debussy, 1884. Branches of the Conservatoire National de Musique exist in the important towns all over France. The requirements of scholarship vary with the different localities. Noteworthy branches exist in Toulouse (1826), Lille (1826), Boulogne-sur-Mer (1884), etc. Another important school is École de Musique classique et réligieuse, founded by Niedermeyer in 1853. A new school was founded in 1896 by Guilmant and D'Indy, 300 students specializing principally in organ and composition based on modern tendencies.

Germany. — Germany has developed more music schools than any other country. Some of these are under the patronage of reigning houses, others are endowed by individuals or societies, but there are numberless private schools existing and flourishing without any financial aid from outside sources.

Berlin. — Königliche Hochschule für Musik. It is divided into three sections. The oldest section is called Royal Institute of Church Music, founded in 1822. It receives only twenty students, and charges no tuition. The second section is called the Academic Master School for Composition (1833). The present masters are Bruch, Humperdink, and Gernsheim. Tuition is free. The third section, which now is the Royal High School of Musical Art proper, was created in 1869. Joachim, the famous violinist, was the first director. Students must be sixteen years and over. The entrance examinations are very severe. A nominal tuition is charged, varying from $7.50 to $100 for the school year. It is interesting to know that each student costs the government on an average about $250 a year, and yet the average tuition charged is less than $75. Excellent private conservatories in Berlin are the Klindworth-Scharwenka School of Music and Stern's Conservatory.

Leipzig. — The Royal Conservatory, founded in 1843 by Mendelssohn, has financial guarantees from the Saxon government and the municipality. It is perhaps still the most famous conservatory in Germany. There are at present about 900 students and forty-five instructors. Some of the great musicians who taught at this school were Mendelssohn, Schumann, David Hauptmann, Richter, Gade, Moscheles, Reinecke, Iadassohn. Among the present teachers are Reger, Teichmüller, Hilf, Sitt, Straube, Klengel, etc. Famous pupils, Kirchner, Bargiel, Brassin, Iadassohn, Grieg, Sullivan, Wilhelmj, Svendsen. A peculiar position is that occupied by the Thomas School in Leipzig. Only boys with pronounced musical talent (" absolute ear " is one of the conditions) are admitted. The boys form the choir of the Thomas Church. The boys receive a complete education without cost. The most famous director of this school was J. S. Bach.

Munich. — Royal Academy of Music (1846). The best known teachers connected with this school were and are Hans Von Bülow, Cornelius, Rheinberger, Abel, Bussmeyer, Stavenhagen, Mottl, Klose, etc. Among its students have been many Americans: George W. Chadwick, Horatio W. Parker, Fred. Bullard, Leo Lewis, Adolf Weidig.

Royal and ducal music schools of high standing exist in Dresden, Stuttgart, Würzburg, Karlsruhe, Weimar, etc. Private conservatories of first rank are to be found in Frankfort, Hamburg, Strassburg, Wiesbaden, etc.

Austria. — Vienna. — Conservatorium der Gesellschaft der Musikfreunde admits pupils from the age of ten to twenty-four years. The German language is obligatory. The attendance is about 1000 pupils, taught by sixty-four instructors. Among the teachers of the present day are Godowsky and Ševčik.

Prague. — Conservatory of Music (1811). Bohemians receive free instruction, but bind themselves to stay six years. Besides the musical education, students receive instruction in all the important liberal branches.

Budapest. — The Royal and National Academy of Music receives students from the age of eight on. The tuition fee is nominal, and no tuition is charged for students of wind instruments, double-bass, viols, etc.

Russia. — St. Petersburg. — The most important conservatory was founded in 1862 by the Royal Russian Music Society. It is richly endowed, and has about 200 scholarships. The average attendance is 800 students, under ninety teachers. The curriculum comprises, besides the study of music, a complete liberal education. The first director was Anton Rubinstein. Famous teachers have been Glasounow, Rimski-Korsskow, Essipow, Auer, etc.

Moscow. — Royal Conservatory of Music, founded by Nicolaus Rubinstein (1866), gives courses similar to the conservatory in St. Petersburg. Famous teachers have been Tanejew, Safanow, etc. There are sixty teachers, and about 600 students. The School of Music of the Philharmonic Society (1878) received in 1886 the same official recognition as the Royal Conservatories mentioned above.

There are numerous schools of music in the provinces which are considered branches of the St. Petersburg Royal Conservatory.

Belgium. — Brussels. — The Royal Conservatory of Music (1813) is one of the most important of the European institutions. Students born in Belgium pay no tuition. Those born in other countries are admitted only if acceptable to the director and the Secretary of State. Famous teachers were: Fétis, Gevaert, Tinel, De Beriot, Vieuxtemps, Leonard, Ysaye, etc.

Liège. — The Royal School of Music (1827) is also one of the important schools in Europe. Conditions are practically the same as in Brussels.

Antwerp. — The Royal Flemish Conservatory (1867) is one of the largest institutions, and has about 1200 pupils and fifty teachers. Tuition fees are very nominal. The first director was Peter Benoit.

Netherlands. — Amsterdam. — The Conservatory of Music is under the management of the Society for Development and Protection of Music (1862). Only about eighty students over seventeen years of age are admitted. These are selected from among the pupils of the preparatory school of music, which is affiliated with the Conservatory. Well-known teachers are Zweers, Röntgen, etc.

Rotterdam. — The School of Music (1845) is under the same management as the one in Amsterdam. It admits pupils from eight years on.

Spain. — Madrid. — The Conservatorio de Maria Cristina (1830) is largely endowed by the State. There are about 1500 students and sixty teachers. Other important conservatories are maintained in Barcelona and Saragossa. All are subsidized by the government, and tuition is practically free to Spaniards.

Portugal. — Lisbon. — The Conservatorio Real (1833) is maintained by the government, which pays all expenses. There are about 300 students and thirty teachers.

Scandinavia. — Copenhagen. — The Conservatory of Music (1867) admits only fifty pupils, according to its constitution. This restriction was made by its financial founder, P. W. Moldenhauer. Lately the government has given a small subsidy, making it possible to admit about twenty-five additional students. Teachers have been, among others, G. Hartmann and N. W. Gade.

Stockholm. — The Royal Conservatory (1871) is a government institution; no tuition is charged except to a few aliens.

Christiania. — The Conservatory of Christiania (1865) is largely subsidized by a private society and the State. The tuition charged is from five to twenty-five Kronen. The present director is Lindermann.

Switzerland. — Geneva. — The Conservatory of Music (1835) has occasionally been able to engage on its teaching staff some of the best known musicians, *i.e.* Stavenhagen, Marteau, Jaques Dalcroze. The latter's *Rhythmic Gymnastic* bids fair to become a pronounced factor in the child's musical education. The Conservatory has about 1200 students and fifty teachers.

Basel. — Music School, director, Hans Huber.

Zurich. — Municipal Music School, director Fr. Hegar.

Great Britain. — London. — The Royal Academy of Music (1822) was endowed by a private society. It is attended by 500 students, and has eighty instructors. Among the famous teachers who have been connected with this school must be mentioned J. B. Cramer, M. Clementi, Bennett, Macfarren, Mackenzie.

The Guildhall School of Music (1880) is perhaps the largest music school in the world, and has approximately 4000 students and 150 instructors. It receives a subsidy from the city.

The Royal College of Music (1883) maintains perhaps the highest standards of all the English conservatories. It was founded by Arthur Sullivan as the National Training School of Music. It is richly endowed, and possesses one of the best libraries. Present director is Ch. H. H. Parry.

Other more or less important schools in London are the Royal College of Organists, director, E. H. Turpin; National College of Music, director, Dr. Tindall; London College of Music, director, I. I. Karn; Birmingham Midland Institute of Music, directors, Elgar and Bantock; Manchester Royal College of Music, director, Adolf Brodsky.

Music Departments in Universities. — Only German, Austrian, and English universities have music in the curricula. While music schools outside of universities make very few demands on their students as to liberal education, entrance into a university requires that students shall have passed final examinations in the gymnasium or preparatory college. The study of music in universities is confined to history and theory. The lectures on these subjects may be attended by students who have not passed the above-named examinations, but are admitted as special students. Only regularly matriculated students may receive the degree of Doctor of Philosophy, after submitting an approved dissertation dealing with a musical subject and showing original research. The faculties of universities sometimes bestow the degree of Doctor of Philosophy or of Doctor of Music on distinguished musicians, but *honoris causa.* Chairs of music occupied by prominent men of the " Science of Music " are to be found in Germany in the universities of Berlin, Leipzig, Bonn, Göttingen, Halle, Heidelberg, Munich, Strassburg; in Austria in Vienna, Prague, and Graz; in England at Oxford and Cambridge; and in Ireland at the University of Dublin. English universities confer the degrees of Mus. Bac. or Mus. Doc., after examination. Examinations also include the writing of *Compositions in various forms.*

United States. — It is possible at the present time to secure a thorough musical education in almost every state of the Union. This is particularly true in the larger cities or in the towns where the proximity to the larger cities offers advantages in regard to hearing concerts and attending opera. But even in more isolated places a good musical education has become possible, as some members of the faculties of educational institutions are, as a rule, excellent musicians who have received a thorough education themselves as either instrumentalists, vocalists, or theorists. It is therefore no longer necessary for music students to go to Europe for study, although it is always desirable to become acquainted with musical conditions of other countries. No music student should go to Europe until he has had a thorough education at home, and he should never leave these shores for further study abroad unless he speaks one or two foreign languages fluently. While it is true that the English language is spoken by almost every well-educated European musician, yet this is a great disadvantage to the American student, as it deprives him of the possibility of a thorough appreciation of European conditions, resulting frequently in absolutely false perspectives and erroneous conclusions.

Colleges and Universities having Departments of Music. — Harvard University. — A Music Department was established in 1862 on equal terms with the other departments. Credits of two points each in harmony and counterpoints are allowed on entrance requirements of twenty-six points. Courses offered are harmony, counterpoint, instrumentation, composition, history of music. The degree granted is the A.B., the requirements for which are eight approved courses, five in music and three in modern languages. A.M. and Ph.D. candidates must be graduates of approved colleges. At least one year of residence at Harvard is demanded. The examination requirements are a thesis on musical æsthetics or history and composition for chorus and orchestra. The annual tuition is $150. Special students are admitted, but are not eligible for degrees.

Yale University, New Haven, Conn. — The music department was founded in 1894. The courses offered are theoretical and practical. The former include harmony, counterpoint, composition, orchestration, and conducting. The practical courses are organ, piano, string instruments, singing, chamber music, and orchestral playing. The degrees and diplomas granted are certificates of proficiency in the theory of music, and the B.M. on two years' work, including two languages, one of which must be modern. Certificates are also awarded to students of practical courses. The tuition ranges from $50 to $200 a year.

Columbia University, New York, N.Y. — The music department was founded on an endowment of $100,000, and the chair of music first occupied by Edward McDowell in 1896. Extra credits are given in musical appreciation or harmony — one point in a total of 14½ required for admission. The courses offered are harmony and history of music, and are open to undergraduates as electives. The degrees of B.A. and M.A. are conferred after passing satisfactory examinations in counterpoint and composition.

The following table gives a list of departments or schools of music connected with universities. In all of them practical and theoretical courses are given.

UNIVERSITY	TITLE	FOUNDED	DEGREES	EXPENSES (TUITION AND BOARD)
Northwestern University, Evanston, Ill.	Department	1873	B.A. & M.A., since 1895	$390–$669
Michigan University, Ann Arbor, Mich.	School	1873, reorganized 1890	B.A.	$15–$90 a course
Oberlin, Ohio	Conservatory	1867	Mus. B. and Teachers' Certificate	$350–$500
Grinnell College, Grinnell, Ia.	School	1875	B.A.	$306–$430
Wisconsin University, Madison, Wis.	School		Mus. Grad.	
Syracuse University, Syracuse, N.Y.	Department	1873	B.M. and Certificate	$325–$500
Illinois University, Urbana, Ill.	School	1895	B.M.	$280–
Boston University, Boston, Mass.	Course		B.A.	
Pennsylvania University, Philadelphia, Pa.	Department	1875	B.A.; Mus. Bac.	$30 a course

Music Departments in Colleges for Women. — Wellesley College, Wellesley, Mass. — No credits are given for music in entrance requirements. Courses in theory and history are open to all students, and count toward the A.B. degree. Practical courses are given in piano, organ, violin, and voice and theory leading to B.A. The length of the course is from four to five years. Special students are admitted, and may receive a certificate of the Department of Music. The expenses for tuition in practical music and board in halls of residence is $450 per school year.

Smith College, Northampton, Mass. — Courses in music may be taken in connection with regular college work, and count toward the degree of B.A. Music may count as one point of credit in the entrance requirements.

Vassar College, Poughkeepsie, N.Y. — Only regularly enrolled students can elect studies in the music department, which may count up to one fifth of all studies required toward the degree of B.A.

Independent Conservatories and Schools of Music. — These have become an important factor in the musical development of America. Every large city has a number of schools comparing favorably with the best schools in Europe, and there is hardly a town which does not support a school of music of its own. Only the most important are mentioned here.

Baltimore, Md., Peabody Conservatory of Music. — Founded in 1868 as a branch of the Peabody Institute, established in 1857 by George Peabody. All branches of music are taught in two main departments: Preparatory (elementary, junior, and intermediate); and Conservatory (advanced, senior, and graduate). There are about 1400 students and 60 teachers. Tuition fees average about $125 a year.

Boston, Mass., New England Conservatory of Music. — Founded in 1853 by Eben Tourjee, and incorporated in 1870; one of the best equipped schools in the world, owning one of the finest buildings for the purpose. The conservatory possesses, besides a large number of studios, two concert halls, a splendid library, a collection of instruments, eleven pipe organs, etc. Complete courses are offered in all branches of music. Candidates for graduation must have been graduated from a high school or must take work in literature. Privileges are interchanged between Harvard University and the conservatory for qualified students. The university credits certain conservatory courses toward the A.B. and M.A. There are about 2700 students, with ninety instructors. The average cost of tuition for the full course per school year is $250.

Chicago, Ill., American Conservatory of Music, 1886. — A school with a faculty of seventy-five teachers and an attendance of over 2000 students. All branches of music are taught, enabling a student to become a practical and theoretical musician. The regular course requires from three to four years of study. After successful examinations graduate and post-graduate diplomas are issued. Special features are normal classes for teachers, a children's department, and a students' orchestra. Deserving students are given scholarships at the discretion of the board of directors. Tuition from $10 to $160 per term of ten weeks.

Chicago, Ill., Musical College. — One of the oldest private schools in the country, founded in 1867. Its organization is similar to that of the American Conservatory of Music, without some of the special features mentioned. There are about 100 teachers and 3000 students. Among the teachers have been some of the best known European musicians.

Cincinnati, Ohio, College of Music. — Founded in 1878 by Reuben R. Springer, with Theodore Thomas as the first director. All branches of practical and theoretical music are taught by about forty teachers. The number of students is 650. Certificates and diplomas are granted after successful examinations. Special features include a school of opera, a students' orchestra, and a students' chorus. Tuition varies according to instruction selected.

New York, N.Y., Institute of Musical Art. — Incorporated 1905 under a charter granted by the board of regents of the University of the State of New York. It has an endowment of $500,000, given by James Loeb. There are seventy teachers and 600 students. Certificates and diplomas are granted in all branches of music study. The tuition per school year varies from $15 to $250, according to studies selected.

Other important schools of music in New York are: National Conservatory of Music; German-American Conservatory; Virgil School of Music; Guilmant Organ School.

Philadelphia, Pa., Combs Broad St. Conservatory of Music. — Complete courses are given in piano, violin, vocal, hand, and orchestra instruments. The following sections are maintained: introductory; advanced; teachers'; diploma; postgraduate; and artists', leading to the degrees of M.M. and B.M. Reciprocal relations are maintained with the University of Pennsylvania, which offers to music students English, French, and German, upon passing satisfactory examinations for admission to college in the subjects chosen, while the university gives full credits for theoretical work done at the conservatory. Tuition from $40 to $200 for the school year of forty weeks.

A. W.

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MUSICAL INSTRUMENTS, MECHANICAL, AND EDUCATION. — Visual aids (*q.v.*) to teaching have long been used in almost every subject and in greatest variety. Auditory aids have not been available until within the last few years, when remarkable inventions have provided such means. These auditory aids consist of the variety of mechanical musical instruments such as the phonograph and similar instruments for reproducing sounds and the pianola and similar mechanical devices for operating pianos. A third type represented by the Welte-Mignon is just being developed which provides for the actual reproduction of the interpretation of a virtuoso or of any individual performer. These three types differ radically in their nature and in the kind of educational opportunity they offer. The first type, by some contrivance of disks, grooves, and vibrating keys, reproduce more or less accurately and with mechanical fidelity any kind of musical sound, including the human voice. The second type operate mechanically the piano and thus produce only one type of music, but that with the instrument of widest musical scope. These latter furnish the technique of the performance, but allow to the individual operator room for the variety of expression and interpretation which renders music an art.

But little use has been made of such instruments in the school, and but slight recognition has been aroused until the last few years. It seems no exaggeration, however, to state that they promise to do for musical education what the various arts of illustration have done for painting, and the art of printing itself has done for general intelligence. The first great educational service which such inventions, especially those of the pianola type, seem to furnish, is that of making musical appreciation as common as the art of printing has made our appreciation of literature. Not only this, but by means of the voice-reproducing instruments, productions artistic both as regards tone and delivery can be given in the schools, thus teaching by excellent examples and employing methods especially essential in the lower grades. There is no reason why a knowledge of the finest music should not be considered an attribute of culture as well as a knowledge of the best literature. Long ago a German educator said: " The fundamental evil in music is the necessity of reproduction of its artistic creations by performance. Were it as easy to learn music as words, the sonatas of Beethoven would have the popularity of the poems of Schiller." And little reason exists why in a coming generation an ability to reproduce the best music with fidelity and artistic expression should not be within the power of any educated person. It seems no exaggeration to say that what printing did for general intelligence, some of these inventions promise to do for artistic appreciation. For by means of unlimited reproduction, which such instruments afford, the same advantage is given as by the printed page. For some generations now a recognition of the place of music, especially of musical appreciation, in education has been growing, and many attempts have been made both for children and adults to develop such power of appreciation or performance. But aside from singing, these efforts have been limited, especially with English-speaking peoples, to adults. Here it has appealed chiefly as an expensive pleasure, limited to a favored few. Now, these mechanical devices remove the difficulty of technique and afford the means of repeatedly reproducing the entire subject matter of music, and of giving the child or operator the pleasure and training of participating in this reproduction. Even with the favored few possessing a musical education, a large part of the world's musical treasures are practically a sealed book, a book which may in time, if the real educational value is obtained, be opened to all.

The talking machine has now become an important part of the equipment of the schools of perhaps 500 or more cities throughout the country. So rapidly has this innovation taken place that few realize the tremendous hold that music has upon people, and the avidity with which educators have seized upon this really wonderful invention, which brings to every child the hearing of the great music of the world. Special records for teaching purposes, in all grades, — folk dances, interpretative dances, folk songs, songs of different nations to correlate with the work in history, records showing the tones of all the instruments of the orchestra, — are now to be had. A course of study for high schools in history and appreciation, using several hundreds of records from the operas, oratorios, etc., has been published. These courses of study, copiously illustrated by splendid reproductions of the voices of the artists, carry into the schoolroom the culture and knowledge of real music, and must prove a boon, especially to the rural, village, and small city schools, where the children never have an opportunity of hearing the great artists, orchestras, and the opera.

It is to be hoped and expected that the schools will soon avail themselves more generally of these inventions and that music may be given a place in American and English culture as a social, moral, and æsthetic agency of vast import as it has long been in some other civilizations.

A second service which the piano player affords is of a more technical character in the beginnings of instruction in piano playing. But as the most comprehensive of all instruments and the one in most general use, this service may be of no slight character, though musicians are more divided or much less enthusiastic in their beliefs as to what mechanical invention can do here than in the cultivation of musical appreciation in general. With the mechanical piano player it is possible to carry any parts of the composition by mechanical means, while the learner may develop his ability to play other parts of progressively greater difficulty. That is, a pupil can play a five-finger exercise and at the same time so operate the instrument with his feet that interesting harmonies will be produced. One marked advantage which this scheme has is that of having the child work on pieces of inherent merit and attractiveness which otherwise would be too difficult for him to attempt. Possessing both advantages and disadvantages which are obvious, this use of the piano player has not been sufficiently tested to enable musical educators to form a judgment.

While the use of the piano player as an aid to musical instruction has had but slight use in the public school, it has been recognized quite generally in American colleges and universities. Not only are these instruments used in many of the institutions as a means to musical education of students, but the professors of music of Columbia, Harvard, Michigan, Oberlin, Smith, Tufts, Vassar, and leading professional musicians have coöperated with the manufacturers in working out elaborate courses in the music of the greatest composers, such as Bach, Beethoven, Chopin, Liszt, Schumann, Wagner, and others as a means to a general cultural education. These courses combine lectures and interpretation with selections.

Thus the general public can obtain real insight into great music by means of actual auditory illustration and expert comment. It is the hope of these educators that in time music may cease to be a special cult, as unfortunately it is in our civilization, and become a matter of common culture depending, as do other elements of culture, not upon a highly technical ability but upon the intelligence and sympathy of the individual.

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MUSIC SCHOOLS. — See Choristers' Schools; Middle Ages, Education During, The Song School.

MUSKINGUM COLLEGE, NEW CONCORD, OHIO. — A coeducational institution established in 1836 and now under the control of the United Presbyterian Synod of Ohio. Preparatory, collegiate, and music departments are maintained. The entrance requirements are fifteen units. The degrees of A.B., B.S., Ph.B., and A.M. are conferred. The enrollment in 1910–1911 was 610. The teaching staff consists of twenty-seven members.

MUSURUS, MARCUS. — See Renaissance and Education.

MUTATION THEORY AND MUTANTS. — See Heredity; also Acquired Characteristics; Evolution; Instincts.

MUTISM. — The inability to speak, due to lack of cerebral development (in idiots), to sensory disorders (as in deafness), or to inhibition or negativism (in dementia precox, (*q.v.*)), or in hysteria (*q.v.*). The acquired mutism is to be distinguished from aphasia (*q.v.*), in which the ability to speak has been lost. Mutism is simulated by the apparent lack of speech in melancholia (*q.v.*) in which there is mental and motor retardation. The inabilities to speak following emotional excitements, *e.g.* fear, are normal conditions. Like mutism they are frequently found in children, especially in those of nervous temperament, and they are often the first symptoms in the development of grave psychoses, *e.g.* dementia precox, hence their importance in education.

Deaf mutes may be educated to use the vocal apparatus, and the absolute mutism may be replaced by speech. There is, however, an incoördination, for the sounds lack the modulation to be found in the voices of normal people. This is because of the inability to correlate the sounds with the movements of the vocal apparatus. Mutism in idiots is incurable, but the mutism of imbeciles may, by appropriate education, give way to a vocabulary sufficient to indicate their wants and desires. The mutism in melancholia is only temporary, and disappears with the improvement in general condition. The dementia precox mutism is also temporary, and may be improved by stimulation and by appropriate training to a slight extent, but the amount of improvement depends upon the accessibility of the patient. S. I. F.

See Deaf, Education of; Speech Defects.

MUTUAL AID. — See Pensions.

MUTUAL INSTRUCTION, SYSTEMS OF. — See Monitorial System; Bell, Andrew; Lancaster, Joseph.

MYOPIA (from late Greek *μυοπία*, from *μύωψ*, from *μύειν*, to shut, and *ὤψ*, sight), or more scientifically Brachymetropia or Brachyopia (from *βραχύς*, short, and *ὤψ*, sight). — That condition of refraction where the antero-posterior diameter of the eye is too great and parallel rays of light entering the eye at rest come to a focus in front of the retina. This defect has now been studied in the eyes of hundreds of thousands of school children; and as a result of the modern investigations the following facts have been pretty well established. There are two kinds of myopia: (1) myopia of high degree, a disease of degeneration more likely to be found among the lower classes; (2) myopia of low degree, the common form, known as functional, frequently not appearing till puberty. It is not a disease, but a defect. The distinction between the two forms was recognized by Dr. Beger in a monograph on nearsightedness, published in 1845.

The question of the cause of myopia is still a much-debated one. Those who agree with Cohn hold that the school with its unhygienic conditions of work is the chief cause and point out that in Germany not only the number of cases but the degree of nearsightedness increases with the age and grade of the pupils. More recent investigations (*e.g.* by Steiger, Miss Barrington, and Karl Pearson) seem to show that myopia, as well as other errors of refraction, are inherited. On another point, also, modern opinion has changed, modern studies showing that the defect of myopia occurs among primitive as well as among civilized people. The most prominent recent theory on the subject has been formed by Stilling, who on the basis of many thousand measurements of the cadaver, maintains that myopia is caused primarily by innate structural peculiarities of the eye socket, and that those who have a low orbit have a tendency to myopia. The practical result of such a theory, on which a controversy has raged for twenty years, would be to make it possible from the shape of the skull and the orbital index to pick out on the first day of school those pupils who have a tendency to myopia and to relieve them from the strain of near work and later to determine the kind of vocational training for which they are fitted.

In no part of the field of school hygiene, perhaps, have more errors prevailed than in this particular chapter. And among the many investigations that have been made during the last hundred years it is possible to find statistical evidence for almost any current error. Not only the teacher, but the specialist himself must be on his guard against being misled by the results of so-called studies of this subject.

Perhaps the best way to summarize important points, and to show briefly the complexity of the problems connected with the genesis and development of myopia and the danger of hasty inferences, is to enumerate some of the errors that have prevailed and still survive in some quarters. Among these are the following: 1. The error of not distinguishing the different conditions of refraction and of confusing weakness of vision from whatever cause with nearsightedness, *e.g.* the cases of hyperopia, myopia, and presbyopia. 2. Even scientific writers often fail to distinguish between pathological myopia and ordinary myopia, which is merely a defect. And even to-day the usual form of myopia and the pathological form are often not distinguished. 3. Some writers like Cohn have believed that the ordinary myopia may develop into the pathological form. The two, however, are distinct, and it seems probable that the former never develops into the latter. In the pathological form, as Stilling puts it, the eye is not diseased because it is myopic; but it is myopic because it is diseased. 4. The error still prevails that myopia is caused by the conditions of civilized life, whereas it is found among primitive peoples as well. 5. The charge is still made even by scientific writers in an indiscriminative way that the school is the cause of myopia. Studies by Steiger have shown, however, that not only do cases of myopia occur at the time when children enter school, but that among nearsighted children the percentage of cases of myopia of high degree is enormously greater than among children who develop nearsightedness later, say at the age of twelve. The pathological form of myopia at least would develop in any case whether children attended school or not. Landolt, Hoor, and others have found myopia of high degree among peasants and soldiers, people who never used their eyes largely for near work, and who never had attended school. 6. The error of supposing that because the number of cases of nearsightedness, especially in Germany, is apt to increase from the lower to the higher grades, the school is responsible for this increase. This inference, plausible as it seems, is not justified by the evidence cited. Not only are many cases likely to develop at the age of puberty, apparently on account of the conditions of growth, but no account is usually taken of the fact that children who are myopic, lacking an interest in outdoor occupations on account of their imperfect vision, are more likely to become interested in school work, and hence more likely to remain to the higher grades of the school. 7. The error is widely prevalent that myopia is caused primarily by near work, whereas it seems to have been amply demonstrated by the studies of Motais, Steiger, Miss Barrington, and Karl Pearson that errors of refraction are inherited. And while the use of the eyes for near work is probably a secondary cause determining largely the development of the defect, it is not the primary cause. 8. The error of supposing that the conditions of the human eye at birth is myopic. This error was due in the first place to the old investigations of Jaeger, who by some erroneous method found that most of the cases of newborn children studied by him had myopia in some degree.

A number of interesting correlations have been strongly suggested, if not established, by modern studies, among them the following: a correlation between the number of cases and physiological development; between the tendency to myopia and sex, girls being apparently more likely to become myopic; between the number of cases and the general environment, the percentage of cases being often greater among the children of the well-to-do; between the percentage of cases and the intelligence of the pupils and their success in school work, myopia occurring more frequently apparently among the more successful pupils; and a correlation according to the shape of the skull, the brachycephalic being prone to myopia. It is also maintained by some that there is a correlation between the number of cases and the degree of civilization in a country, and likewise between the number of cases and the hygienic condition of the schoolhouse and school environment.

Very extreme views have been held by some of the leaders of the controversies waged in regard to myopia. On the one hand, Schnabel and others have maintained that myopia is a good thing, that it means the perfection of the eye for the finer occupations and near work required by civilized life; while on the other hand are those who have taken an extremely pessimistic view and taught that myopia is a disease, that all are liable to the defect, and that all cases are liable to develop into the pathological form.

There are many unsolved problems in regard to myopia, and further studies are needed; but those who would learn the present condition of our knowledge in regard to this defect should be suspicious of the popular writings, and consult among investigators, not Cohn and the older writers, but rather Steiger and Karl Pearson.

While the net result of modern investigations has been to show that heredity is the primary cause of myopia, that it is probably in large part due to innate structural peculiarities of the eye, and that the school and near work are only in a secondary way responsible, these results do not make the demands of hygiene less important. While it may be quite impossible to prevent the development of myopia, it is a significant fact for hygiene that probably from ten to twenty-five per cent of the children in any school are likely to have this defect or else a tendency to it, and it is necessary to make the conditions hygienic for such myopic eyes. They should be tested by competent oculists, fitted with suitable concave lenses, the error of refraction fully corrected, and the ordinary well accepted rules for the hygiene of the eye should be observed. W. H. B.

See Eye, Hygiene of; Astigmatism; Hyperopia.

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MYSTICISM. — Mysticism is that type of religion in which the soul endeavors to apprehend eternal realities immediately by an inner experience. It places little emphasis upon rites as a means of influencing the deity or of obtaining power and sanctity, or upon obedience for the sake of rewards, but it endeavors to obtain a present enjoyment or foretaste of eternal bliss by a suitable training of the soul. Together with the sacramental idea, mysticism is present as a normal religious phenomenon in many higher forms of religion, especially those in which asceticism is developed. In primitive Christianity it finds its expression in the New Testament in the writings of Paul and John. Although the name mysticism is taken from the Greek mysteries, it was long before they had any influence upon Christian mysticism and early resemblances cannot well be explained upon any theory of borrowing. In Christianity mysticism took two distinct lines of development, a more emotional and a more speculative. In the East the former is seen in Ignatius of Antioch (*ob. c.* 115) who first developed the Johannine tradition, then in Irenæus, Methodius, and Athanasius, and, in a somewhat different form and more strongly influenced by contemporary Hellenic philosophy in Clement of Alexandria and Origen. In the West this Mysticism found its first great exponent in Augustine, who in his *Confessions* passes far beyond any Neo-Platonic mysticism he may have retained; for however much Neo-Platonism influenced Augustine's doctrine of God and of evil, his mysticism, anticipated somewhat by Ambrose, has a different content and establishes a new type of piety. Its influence upon Western thought appears again most impressively in Bernard of Clairvaux in language which recalls both the rapture and the diction of the *Confessions.* The principal source of speculative Christian mysticism is the works of the Pseudo-Dionysius the Areopagite, written under the unmistakable influence of Proclus the Neo-Platonic philosopher. These works were written about the end of the fifth century, purporting to be the writings of the Athenian convert of St. Paul, and accepted generally as such they profoundly influenced religious thought. Their authenticity is now defended by no scholar. The Areopagite took over the Neo-Platonic metaphysics of his master and his practical method whereby the soul after passing through stages of purification, illumination, and completion became one with the primordial being. These three stages reappear in all systems of the Christian mystical theology. In thus adapting Neo-Platonism to Christian mysticism, the Pseudo-Dionysius considerably Christianized it and Maximus, the Confessor, who wrote a commentary upon Dionysius, carried the process still further. The influence of the Areopagite in the West dates from the ninth century and John Scotus Eriugena, who built for himself upon him a system of pantheistic mysticism.

After the introduction of Dionysius the Areopagite into the West, mysticism, except as the pious experience of saints such as Anselm of Canterbury and Peter Damiani, plays no prominent part until the development of mystical theology in the twelfth century under the general intellectual revival of that age. From the first in this revival both types of mysticism are clearly developed and in the closest connection. Hugo of St. Victor (1078–1141) is the first after Eriugena to comment on the Areopagite and also the first of the greater mystical theologians, tracing clearly and successfully the foundation of mystical theory and basing it upon a psychological analysis of man's religious nature and mental and moral powers. After him Richard of St. Victor (*ob. c.* 1174) and Bonaventura (1221–1274) develop the system, building upon the foundations laid by Hugo. With these three the theory of mysticism as worked out in the Medieval Church is complete. The metaphysical and psychological basis of this theory always remains strongly tinged by the Neo-Platonism of the Pseudo-Dionysius and the connection can always be traced. But the theory is by no means merely metaphysical; there are always two ways of attaining the goal of mysticism, an ethical and an intellectual, which are only different sides of the same process; for to know anything one must share in its nature. In this lay the basis for the union of the various types of mysticism into one general theory. It, too, was derived from Neo-Platonism.

The significance of mysticism for pedagogy is that in it, by an analysis of the soul's life, a psychological basis was won for a religious pedagogical theory which corresponded to the ideals of life of the times. This theory is not worked out systematically in any one treatise, not even in Hugo's *Eruditio didascalica* or *Didascalicon de studio legendi*, the most important educational treatise written by any of the medieval mystics, but it underlies a great mass of ascetic and devotional literature and is not difficult to grasp. This pedagogical theory corresponds to the monastic ideal of life, which till nearly the time of the Renaissance was dominant in Western Europe. Monasticism as it was organized by Benedict, and even as it was reformed under the influence of Cluny, provided little more than the outward conditions for the higher religious life, and it was only in and through mysticism that monasticism received its higher pedagogical principles and was brought into vital relations with the intellectual movements of the age. While scholastic theology was a practical science, mystical theology had always a practical end, a pedagogical purpose; for in tracing the stages of the soul's advance to higher spiritual experiences and to the end of all, union with God, it provided means for a systematic training of the whole spiritual nature. In its Areopagitic form mystical theology revealed a religious content and significance in science. This is clearly brought out in Hugo's *Eruditio didascalica,* to which the other mystical and theological works of Hugo form a useful supplement. In form the *Eruditio* is in imitation of the encyclopedic works of Isidore of Seville, Hrabanus Maurus, and others, a comprehensive survey of the various profane and sacred sciences. (See HUGH OF ST. VICTOR.) A pedagogical theory, which aims at the cultivation of the purely spiritual functions, comes into close contact with the science of the times; in fact, brings it into its system.

However much the intellectual side of mysticism might be emphasized in a work which professedly treated of the method whereby science might be used in mystical training, the ethical side is as essential to mysticism as it was to Neo-Platonism and was closely connected with the cogitative process and the way of purgation. It is only less psychological, and is more ascetic and devotional. The soul approaches God by purification of the heart; for one sees only as he is what he sees. In the case of God, he can know God only as he loves God. Therefore, by ascetic training a man frees himself from the external world and the life of the senses, with its passions and desires. He is trained in virtue, and here mysticism and theological ethics are one. This training differs from the popular ethics in being a preparation of the soul rather than a means of acquiring merit. The soul, thus prepared by ascetic discipline intelligently directed, and by meditation upon the facts of divine redemption, attains the same result as in the intellectual training, which it must always accompany. In perfect union with God, the soul loves nothing less than God, loves all else than God only as they are seen to be included in the love of God.

In the hands of Bernard (*q.v.*) who joins it indissolubly with the monastic asceticism, mysticism obtained a power of conviction which left a permanent impression upon Western religion. It does not lend itself to any appropriation of contemporaneous science; it cannot be formulated in a pedagogical theory, but it can be easily detected as reënforcing the emotional side of mysticism which was in danger of being lost in an intellectual process. It was of special value in the religious training of the age in revealing higher forms of sanctity attainable by those who were not adepts in speculation. Even laymen, especially those who were affiliated with monastic institutions, came to have a place in the new training designed primarily for monks. This is especially clear in the later mysticism of Germany. On account of the ascetic character of mystical devotion, mystical writings are commonly classed as ascetic writings. They have never ceased in the religious world. The most remarkable of works of devotion and courses of spiritual training, the *Spiritual Exercises* of Ignatius of Loyola, is essentially a work of mysticism, and the methods of the Victorines and Bonaventura are manifested throughout it.

Only medieval mysticism is of special pedagogical significance. It alone corresponded to the ideals of the times. In the later Dominican mysticism, popularly known as German mysticism, there is little distinctive that needs to be noticed. Notwithstanding Eckhart's departure from orthodoxy, he stands for the most part upon Thomas Aquinas. He and Tauler, together with several others, differ from the older mystics principally in extending their work beyond the monastic life and by writing in the vernacular. This later mysticism, although the little treatise *Theologica Germanica* was highly esteemed by Luther, is not to be regarded as leading the way to the Protestant Reformation. Its spirit is distinctly medieval.

Mysticism in the West is by no means confined to the Medieval Church. It constantly appears in Protestantism, to mention only in German the theology of Luther and Pietism, in the Anglican Communion, the mysticism of Andrewes, Wilson, and Law and the rich hymnody of the Wesleys. How widespread it is in Protestantism William James shows in his *Varieties of Religious Experience.* In Protestantism mysticism is Augustinian, rarely Areopagitic. In the modern Roman Catholic Church, mysticism has taken a new development, especially in the hands of Görres. In his treatment, the whole mass of " mystical " phenomena is classified and the miraculous element, little emphasized by earlier mystics, is stressed. Accordingly, mysticism is regarded as a higher knowledge made possible by an imparted higher light and a higher, *i.e.* miraculous, activity made possible by an imparted higher freedom, in the same way that ordinary knowledge and activity are possible by the light and freedom implanted in the soul. This explanation, established by a novel analysis of the spiritual and mental faculties, gives an interesting explanation of the miraculous, sees a new and wider scope in mysticism which is recognized as a widespread religious phenomenon, and distinguishes between true and false mysticism, formerly a difficult matter. True mysticism, accordingly, is that in which man actually stands in relation to God and this is possible only when in his ordinary religious consciousness he holds the right conception of God. But in all these modern developments, wherever they appear, mysticism has departed from the pedagogical point of view which it may be said to have had in the Middle Ages as a method of spiritual training.
J. C. A., Jr.

See articles on the chief writers referred to above, *e.g.* CLEMENT; for school systems, inspired by the influence of mysticism. See BRETHREN OF THE COMMON LIFE; FRANCKE; JESUS, SOCIETY OF, EDUCATIONAL WORK OF; PIETISTS; PORT ROYALISTS; etc.

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The various histories of philosophy and of Christian doctrine should be consulted. Of the latter, the best presentation of mysticism is that given by Thomasius, *Dogmengeschichte,* ed. Seeberg. (Erlangen and Leipzig, 1889.) — See also Reuter, *Augustinische Studien.* (Gotha, 1887), and works on Neo-Platonism (*q.v.*) and the School of Alexandria.

MYTHS AND MYTHOLOGY.

— Definitions. — Mythology may be said to be the prehistoric form of existing religions, just as superstitions may be termed the survivals of otherwise extinct beliefs. Religious feeling of some sort is common to all mankind, but it has not developed equally or in the same direction among every people. It keeps pace in general with the advance of civilization and material prosperity. The term mythology has been applied to that form of belief which has been developed especially under literary influence, while religion commonly denotes the serious belief of peoples as represented by the Church, and superstition means the semiconscious beliefs handed down from generation to generation by word of mouth.

Each of these has its special devotees: the poets love to dwell in mythological realms, the philosophers explore the field of religion, while the common people hold firmly to their superstitions. And all of these things have probably been as true for thousands of years as they are now. Any given legend, doctrine, or superstition may usually be readily traced back for centuries among the various peoples having a historic past; and the same is doubtless true for the others without a known past history.

A myth is some particular religious legend considered by itself, and hence it is the unit from which mythology is constructed. It usually belongs in its most perfect form to a rather primitive stage of development in the scale of civilization, as in later times it is apt to become merged in a confused mass of tradition. It should further be observed that in a restricted sense and as commonly employed the term "mythology" denotes the legends told by the ancient Greek and Roman writers concerning their gods and heroes, and since their day perpetuated by literary men in all the nations of the modern civilized world.

Theories. — Various theories have from time to time been advanced by scholars to account for the origin of myths and legends. Some have tried to see in them attempts at popular etymologies, by which process some fanciful tale was invented to account for an epithet commonly applied to some deity. Such stories are best exemplified in the *Metamorphoses* of Ovid, whose popularity has always been deservedly great. Others have wished to account for their origin by referring them back to the great natural phenomena which were thoroughly appreciated in all their grandeur by early peoples. This theory has of late years been in special favor with the modern school of anthropologists. Still others would have it that they are but a generalization and idealization of ordinary human activities and attributes, thus offering a wholly rational explanation of a common mental phenomenon.

In all cases of theorizing, however, it would seem to be highly important to compare the mythologies of various nations in all stages of civilization in order to gain a broader view of the whole field than would otherwise be possible. This special phase of the subject is denominated Comparative Mythology.

Greek and Roman Mythology. — In the Golden Age of Greek and Latin literature, which we commonly call the classical period, the old religious beliefs had lost their hold on educated men, and thus it came to pass that the poets of the time were wont to relate the old mythological stories in a half credulous fashion which was fortunately well adapted to their artistic purposes. And indeed mythology was so closely interwoven with the whole of classical civilization that it would have been impossible for any one entirely to free himself from its influence. •

With the coming of Christianity and its rapid spread throughout the Roman Empire, the old mythology was relegated more and more into the background. It was afterward perpetuated during the Middle Ages solely by the efforts of literary men, until at the time of the Renaissance its cultural influence became very strong, especially so in Italy. In more modern times mythology has once more waned in popular estimation, being driven out more and more from the public consciousness by the constantly increasing rôle played by science. Only in the realms of art and literature is classical mythology still an important factor.

Celtic and Teutonic Mythology. — There is, however, another influence in modern Europe, whose mythological power is great; namely, the traditions of the Celtic and Teutonic peoples, whose ancient beliefs still form an essential part of our intellectual life. The former is as beautiful and graceful as the Greek, and it possesses an immense poetic power, with its direct appeal to the imagination; the latter, with its crudeness and stern warlike note, gives stamina to our being, and fosters the more practical qualities that have built up Anglo-Saxon civilization. For English readers the Celtic gods and heroes are the natural inhabitants of a British landscape, especially so in the wilder and more mountainous western section where the original inhabitants of the land lingered longest. Thus, in the west of England, in Wales, in Scotland, and especially in legend-haunted Ireland, the hills and dales still keep memories of the ancient gods.

Teutonic mythology is closely akin to great natural phenomena in their earliest attainable form. But as civilization began to exert an appreciable influence on the Northern peoples, it was profoundly modified both by the process of internal development and by the external force of the Christian religion. At the present day the old mythology has among the educated classes been relegated largely to the nursery; but among the common people its influence on their religious beliefs is still powerful.

Uncivilized Mythologies. — A great deal of attention has been paid of late years by anthropologists and students of folklore to the religious beliefs of semicivilized, barbarous, and savage peoples; and a vast amount of material bearing on this subject has been gathered up, chiefly from oral sources. Investigations based on such material are of great importance as showing the workings of the human mind in the religious sphere, and as throwing a strong light on the prehistoric phases of our own beliefs.

Mythology had its birth, unquestionably, among uncivilized peoples. There we find that when the mind is fresh the mythical fancy has its creative hour, and develops the most varied and fantastic forms; and these manage to perpetuate themselves long after their original significance has been outgrown and forgotten. Thus we see that the myth-making tendency is strongest, and exerts its most effective influence, when a race is passing through its formative stages such as are well represented in the savage races of the present day. Every student who attempts to penetrate back to the sources of a civilized people's religious faith will find himself surrounded by a luxuriant growth of mythological legends which may seem weird and strange to him merely by reason of their remoteness from the mental life of modern times.

In the western hemisphere the European races have during the last few centuries been brought into direct contact both with the legends and beliefs of the aboriginal Indians and with those of the negro races in the persons of the numerous slaves imported from Africa. As modern civilization has inevitably influenced both of these subject races (the former but slightly, the latter profoundly), there is presented to us the rather curious phenomenon of the forcible grafting of one system of mythology upon another older and more primitive system; just as in England the Teutonic mythology was superimposed within historic times upon the Celtic mythology of the subjugated inhabitants who had previously been politically supreme in the island.

Mythology in Schools. — Of late years there has been considerable discussion in educational circles as to the relative value of history and mythology in the curriculum of the schools,— of the facts of the past and of its legends. The extensive literature which has received its chief inspiration from myths of all sorts, the many classical dictionaries and textbooks on the subject, all bear testimony as to its importance as a study.

In the use of mythology for this purpose it is of the utmost importance to approach the subject in the proper spirit, and to bear in mind the particular needs as well as the stage of mental development of the class to be instructed. Take the story of Arachne, for instance. It may be used with very young children as a nature myth, explaining in an interestingly dramatic way the origin of the spider and its peculiar characteristics. Used with older children, however, and emphasis being laid on Arachne's pride and willfulness, the same myth can be just as profitably employed to accomplish an ethical lesson. The same story with grammar-grade pupils might also be treated as a bit of historical material, showing how early man blended his religion and the nature world. Or again, consider the Tyrolian legend of the origin of flax, which will serve to illustrate the many-sidedness of myths and their adaptability to the various other studies of the child. This story, used as a character study in a reading or language lesson, may be correlated with the study of plant life in science, or with the consideration of raw products in geography; or in history it affords a poetic explanation of the beginning of one of Europe's greatest industries.

To use a myth primarily for a reading or language lesson would not be very purposeful. The most important use of myths at any time is to furnish thought food for that particular period of the child's development. Indeed, it is contended by many educators that history proper appeals only to the understanding, but that mythology, with its attractive legends, stimulates the imagination of the pupil; and that the one study is as essential in the development of the student's mind as the other.

G. C. K.

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NAGEL'S TEST. — Nagel's test for color blindness and lesser defects in color discrimination is doubtless the best simple test yet devised. It is specially valuable in testing large numbers of persons quickly (railroad, army, and navy service). It consists of two sets of small cards on each of which there is printed a series of colored dots, each about 4 mm. in diameter, arranged at equal distances on the circumference of a circle. The principle of the test is, of course, to give the dots on each card colors peculiarly likely to be confused, or perceived as identical in color, by the color defective. The first set has sixteen such cards; these are spread out on a table before the subject, in good daylight, and he is then to view them from a distance of about ¾ m. (since the dots should be seen in foveal vision) and indicate, first, all cards possessing reddish dots and, second, all with only reddish dots. The same procedure is then repeated for green and gray. By following the brief but adequate directions accompanying the cards, any experimenter of reasonable intelligence may, by this first set of cards, in a short time eliminate from a number of subjects the color defectives. The second set of four cards is designed to determine the particular type of color defect present. It has been found that the average person may be tested in less than two minutes.

The charts of Stilling may be used as preliminary test; they do not, however, give certain results. On a sheet of nearly uniformly colored dots there are intermixed others, in colors likely to be confused with these, arranged in the form of a letter or an Arabic numeral. The subject is required to decipher the letters and numerals on the various test sheets. Holmgren's test (*q.v.*), or some modification of it, and Stilling's and Nagel's tests are probably the three most used for the testing of color vision for practical purposes. Of these the best is Nagel's. For more detailed laboratory investigation one should have recourse to Hering's tests or to the spectral color mixer. For descriptions of these the literature of the subject must be consulted. R. P. A.

See Color Blindness.

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NÄGELI, HANS GEORG (1773-1836). — Composer and teacher of music, born in a village of the canton of Zürich. He studied at home and at Zürich, where he later opened a music store and lending library, and gave music lessons. In 1800 he issued a periodical dealing mainly with music. In 1810 with M. T. Pfeiffer he published *Die Gesangbildungslehre nach Pestalozzischen Grundsätzen* (*Theory of Instruction in Singing on Pestalozzian Principles*). This work had considerable influence on the introduction of singing as a regular school subject both in Europe and the United States, where the work was introduced by Lowell Mason (*q.v.*) and W. C. Woodbridge (*q.v.*).

See Music.

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NANCY, UNIVERSITY OF, FRANCE. — The University of Nancy is the direct successor to the university established at Pont-à-Mousson by Papal Bull of 1572 on the petition of Duke Charles IV of Lorraine and the Cardinal of Lorraine. At first only the faculties of theology and arts were organized and placed in the hands of the Jesuits. In 1582 the faculty of law was established and in 1598 the faculty of medicine followed. The university met with great success and, with the college or secondary school, numbered 2000 students, the majority in theology. The Thirty Years' War and the subsequent wars of that century put an end to the progress of the university. In the eighteenth century the dukes of Lorraine, especially Duke Stanislaus, aimed to promote higher learning at Nancy. He established a public library, an academy, and a medical college. In 1768 the university was transferred from Pont-à-Mousson to Nancy and continued there until the time of the Revolution (1793). It was not reëstablished in the reorganization of Napoleon. A medical course was, however, conducted privately from 1822 to 1843, when it became the *École préparatoire de Médecine et Pharmacie.* In 1854, as a result of a public appeal, the university was restored with faculties of letters and science; in 1864 the faculty of law was established; in 1870 the School of Medicine became a faculty. The Franco-Prussian War drove many members of the University of Strassburg (*q.v.*) into exile; many were welcomed at Nancy and the whole medical faculty was taken over in 1876. In addition to the four faculties there is also an *École supérieure de Pharmacie.* The enrollment in 1911 was 2184 (law, 491; medicine, 440; science, 793; letters, 402; pharmacy, 58). The following institutions at Nancy, some conducted by members of the university faculty, some independent, may be mentioned: *École Nationale des Eaux et Forêts; Institut Chimique; Institut Electrotechnique et de Mechanique Appliquée; Institut Agricole;* and the *Institut Colonial.*

See FRANCE, EDUCATION IN.

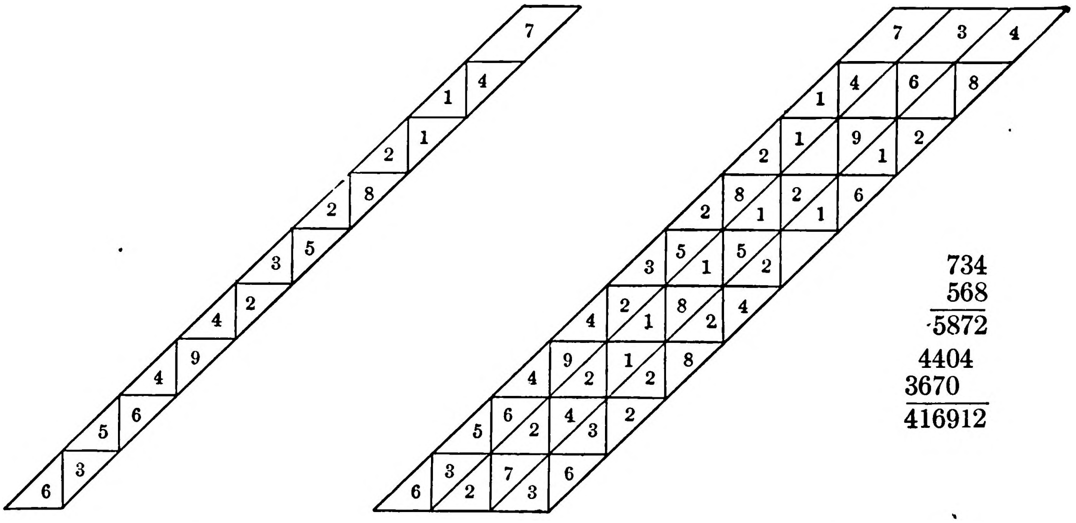
NANTES, SCHOOL OF MEDICINE AND PHARMACY. — See above.

NAPIER, JOHN, BARON OF MERCHISTON (1550–1617). — Scottish mathematician, commonly known as the inventor of logarithms (*q.v.*). His name appears in various forms, as Neper, Neperus, Naper, Napier, Napeir, and Nepier. He matriculated at the University of St. Andrews in his thirteenth year. Little is known of him, however, from that time until the publication of his strong anti-papal *Plaine Discovery of the Whole Revelation of S. Iohn,* which appeared at Edinburgh in 1593 (second edition, with the title as here given, 1611). He seems about this time, or at any rate by 1594, to have been occupied with his plan of simplifying numerical calculations, particularly those that enter into trigonometry. His logarithmic tables were first published in 1614 under the title *Mirifici Logarithmorum Canonis Descriptio.* D. E. S.

See LOGARITHMS; NAPIER'S RODS.

NAPIER'S RODS. — In 1617 Napier (*q.v.*) published at Edinburgh a work entitled *Rabdologiæ, seu Numerationis per Virgulas, libri duo,* in which he set forth a scheme of multiplication and division by means of rods marked as shown in the accompanying illustration. As arranged by Napier each rod was a parallelogram with an angle of 45 degrees, although those usually sold at present are rectangular in form. In the illustration here given, one of the rods is shown with the number 7 at the top, and the products of 7 by the various digits below. A group of rods is also shown giving 734 at the top. If we wish to multiply this by 568, we can at once read off the partial products, so that all we need to do is to arrange the rods as shown, write down the partial products, and add.

Since the rods were at first made of bone, they are often called Napier's Bones. They never had any extensive use, but they can still be purchased from certain dealers. As a school device they add a little to the temporary interest of the pupils, but their value ceases here. D. E. S.



NAPLES, UNIVERSITY OF. — Founded in 1224 by Frederick II, who forbade his subjects to attend any other institution for higher learning. Unlike the other universities of the period, the University of Naples was thus established by decree of a monarch before there was any organization of studies or students. The institution met with very little success and was in abeyance and "reformed" several times before it began to show signs of prosperity under the encouragement of Charles of Anjou and Pope Clement IV, who reorganized it in 1266 with all the faculties, including medicine and theology. In the last-named faculty

Thomas Aquinas was for a time lecturer. Another feature which distinguished the University of Naples was the fact that control was wholly in the hands at first of the Royal Chancellor and then of the Grand Chaplain. Examinations for the doctorate were superintended by him and the diploma or license was issued in the name of the king. Such control retarded progress for some time. Under the reorganization of 1860 the university has made steady advance. The following faculties are maintained: jurisprudence; medicine and surgery; physical science and mathematics; philosophy and letters; and a school of pharmacy. The student enrollment in 1908 was 6602, of whom 2627 were in the faculty of jurisprudence.

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NAPOLEON AND EDUCATION. — The educational system which was introduced by Napoleon and which in its outline has survived in France to the present day is of interest as an attempt to realize a dominating political ideal through the schools. Political aims and political ideals could, according to Napoleon, only be realized through a well-organized teaching body. "Of all political problems," he says, "this is perhaps of prime importance. An established political state will be impossible without a teaching body with established principles." And elsewhere: "My aim in establishing a teaching body is to have a means of directing political and moral opinions." The organization of the Jesuits to a large extent could have realized his objects, and he would have put the schools in their charge, if they had not been subservient to a "foreigner." For a time he and his advisers thought of employing the Oratorians, or the Congregations of the Doctrine, or the Benedictines, or all three. Later, however, he was opposed to ecclesiastical teachers, because "priests look upon this world only as a vehicle to conduct to the next. I want the vehicle to be filled with good soldiers for my armies." Good soldiers and citizens loyal to his person were to be product of his educational scheme. The basis of instruction was to be (1) the Catholic religion, (2) loyalty to the emperor, and (3) obedience to the statutes of a teaching body. All alike, pupils and students, teachers and professors, were to be creatures of a large administrative machine. A curious omission from Napoleon's scheme was the neglect of a thorough provision of elementary education. Elementary schools are mentioned in the decree of 1808, and their organization was promised for the future, but little was done. The Christian Brothers (*q.v.*) were to be allowed to conduct their schools, provided they became members of the university and took an oath of allegiance. In this way Napoleon hoped both to economize on the budget and to break the independence of the Christian Brothers. Napoleon seems to have repented of the omission, but too late, when he issued a decree in 1815 (Apr. 27) "on the importance of primary education for the improvement of the condition of society."

By the Law of May 10, 1806, the Imperial University was created and charged with the sole care of public instruction and education. The decree organizing the university was issued on Mar. 17, 1808, and contained the following features: All public education is in the charge of the university. No school or educational institution could be opened outside the university or without the authority of its head. No one could open a school or teach publicly unless he were a member of the university or a graduate of one of its faculties. The university for administrative purposes was to be divided into academies, each with its own faculty; *lycées*, thirty in all, for instruction in classics, history, rhetoric, logic, and the elements of mathematics and physical science; *collèges*, or municipal secondary schools, giving but the elements of the curriculum of the *lycées* without rhetoric and logic; private institutions of secondary character; boarding schools; and elementary schools to teach reading, writing, and elements of arithmetic. At the head of the whole system was to be a grandmaster assisted by a chancellor, or secretary, and a treasurer; a University Council of thirty members was to be appointed partly by the emperor, partly by the grandmaster. Each academy was to have a council of ten. The grandmaster was to appoint twenty to thirty inspectors-general and rectors of academies. Subordinate officers were to be academy inspectors, professors, principals, regents, teachers, etc. To provide teachers a normal school for 300 students was to be created at Paris. The efficiency of the machine was to be further secured by requiring celibacy from all engaged in schools without the rank of professors. No member of the teaching body could leave the service without permission from the grandmaster. By a decree of Sept. 17, 1808, all institutions which were not provided with a diploma from the grandmaster by Jan. 1, 1809, were to be closed. In 1811 (decree of Nov. 15) the system was further extended by a proposal to raise the number of *lycées* to 100; by compelling institutions and boarding schools in towns where a *lycée* or *collège* already existed to send their pupils to these schools and to limit themselves to repetition of the school work; by limiting the curriculum given by institutions and boarding schools in towns where a *lycée* or *collège* did not exist. (For the later development of the system see FRANCE, EDUCATION IN.)

The education of girls Napoleon did not consider to be of importance. For girls the destination is marriage and "of all educations the best is that of mothers." He seems, however, to have been at some trouble to prescribe the curriculum for the school at Ecouen, a boarding school for the daughters and sisters of officers of the Legion. "Religion is an important matter in a public institution for girls. . . . Train believers not reasoners," for religion will supply qualities otherwise unattainable by the weaker intelligence of women. The secular subjects were to include ciphering, the vernacular, orthography, geography, and history; a little botany and natural science for the older girls; music and dancing; but the chief attention was to be devoted to the preparation of mothers and home-makers, so that about three quarters of the day was to be given up to the manual work connected with a home. The scheme seems to have been carried out, but the severity of the discipline and the burden of the practical work seem to have made the school distasteful to many of the pupils.

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NARCOLEPSY. — Is an abnormal condition of sleepiness in which the individual has a tendency to go to sleep many times during the day, the sleep lasting from one or two minutes to several hours. The impulse or tendency to go to sleep is so strong as to be almost irresistible. The condition is sometimes produced by physical causes, such as ocular fatigue, anemia, diabetes, uremia, gout, and certain drugs. It is a common symptom in hysterical persons, and is sometimes a psychic equivalent for epileptic convulsions.

Any unusual amount of sleepiness, especially in children, should be looked at with suspicion, and an appropriate medical examination made to determine its cause. If brought about by a state of fatigue, whether from eyestrain or from any other similar cause, due measures may be taken to overcome it, and the child will return immediately to a normal condition. If the narcolepsy be an epileptic or hysterical symptom, the individual must be treated for these diseases, and if it be found in a child, due allowance must be made by the teacher for the diseased condition. The opposite condition is called insomnia. S. I. F.

NARCOTICS. — Concerning the narcotic effect of tobacco upon health, there has been much discussion. The fact that the stem and leaves of the tobacco plant contain a poisonous substance (nicotine) which in concentrated doses quickly kills small animals, proves nothing regarding the effect of smoking or chewing tobacco; for in both of these ways of using tobacco, the nicotine is exceedingly diluted, as is the poison found in tea and coffee. It seems certain that indigestion, irritation of the respiratory organs, and heart and nervous disturbance may in some people result from the use of tobacco, while others show no apparent effect. All this refers to healthy adult men, for many medical authorities agree that tobacco is *always harmful to growing boys*, and interferes with their physical and mental development. The whole physiological truth about tobacco so far as now known is that: (1) no one needs it except to satisfy an established habit; (2) many adults are injured by it, and no one knows just how much will do harm to a particular person; (3) some adults are apparently not harmed by limited use; (4) it is decidedly injurious to growing boys; (5) those who avoid establishing the habit in youth do not as a rule care to learn later, for there are no physiological reasons why any one should deliberately set out to learn the use of tobacco in any form.

It is now well known to physicians that temperance is needed in the use of tea and coffee no less than with alcoholic drinks. Their effect is due to the presence of a powerful drug (*e.g.* caffeine), which acts on the nervous system. Nervousness, insomnia, headache, and indigestion are common symptoms arising from their excessive use. Many people are injuriously affected by tea and coffee, but others are apparently benefited by a limited use of these beverages. However, they should never be given to young children.

Concerning the effect of various narcotic drugs in common use there is no question as to disastrous effects of such drugs as opium, morphine, cocaine, laudanum, chloroform, chloral hydrate, and various patent or secret preparations, when habitually used.

M. A. B.

See ALCOHOL, PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF; TEMPERANCE INSTRUCTION.

NARRATION (Rhetorical). — See COMPOSITION.

NARRATIVE METHOD. — In teaching history in the primary and intermediate grades a systematic study of history by topics or movements is avoided. The children lack the motive for the study of historical facts so organized. Hence, in the lower school grades a basis in historical fact is established through a study of (1) the great personages of history, and (2) the dramatic incidents and stories of history. When events are grouped about a personality, we have the "biographical method"; when the selection of historical facts is made upon the basis of their contribution to an interesting story, we have the "narrative method." These methods are merely preliminary to a more systematic historical study and have a value (1) in interesting children in history, (2) in acquainting them with the main personalities and events of the past, and (3) in giving the pupils a basis for interpreting and motivating later study of a more thorough and scientific type. H. S.

See History, Teaching of.

NASCENT PERIODS. — A term borrowed from chemistry to indicate the periods in child development when certain characteristics are in process of formation.

Human development, both physical and mental, is not uniform, but subject to periods of rapid and slow growth. Many attempts have been made to distinguish these stages of development, the results differing according to the points of view. Thus some of the classifications have been built up upon the theories of recapitulation and other similar theories. Others are based upon anthropological and anthropometric investigations, and still others upon the results of psychological observation and experimentation.

Vierordt distinguishes seven stages, based upon measurements of the bodily organs. They are as follows: (1) from birth to eight months; (2) from eight months to seven or eight years; (3) from seven or eight to fourteen years; (4) from fourteen years to twenty-one or twenty-two; (5) early adult; (6) later adult to sixtieth year; (7) old age. Bagley gives three periods of development during the school life of a child. They are as follows: (1) the transition stage, from the age of six to eight; (2) the formative stage, from eight to twelve; (3) the adolescent stage, from twelve to eighteen.

Kirkpatrick enumerates the following stages, based upon a study of changes in social sensitiveness in the various periods; (1) presocial, up to close of first year; (2) imitative and socializing stage, up to three years of age; (3) individualizing stage, up to six years; (4) pubertal or transitional, up to eighteen; (5) later adolescence, up to twenty-four.

It is evident that all such attempts at classification must vary with the characteristics selected as the basis of the classification. Furthermore, the ages mentioned are only approximations, and cannot be expected to hold generally. The advantage to the educator of knowing the stages of the child's development lies in the fact that changes are most easily accelerated at the natural time of their appearance and may even be impossible at a later or earlier period. It is also probable that normal development in an earlier period lays the proper foundation for development in subsequent periods. E. H. C.

See Growth.

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NASHVILLE UNIVERSITY, NASHVILLE, TENN. — See Peabody Educational Fund.

NATAL (AFRICA). — See South Africa, Education in.

NATAL UNIVERSITY COLLEGE, PIETERMARITZBURG. — See South Africa, Education in.

NATIONAL ACADEMY OF SCIENCE. — See Scientific Societies.

NATIONAL AID TO EDUCATION. — See National Government and Education; School Funds, Permanent.

NATIONAL CONFERENCE COMMITTEE ON STANDARDS OF COLLEGE ENTRANCE. — See College Requirements for Admission; College Examination Boards.

NATIONAL CONGRESS OF MOTHERS. — See Parenthood, Education for.

NATIONAL COUNCIL. — An organization, within the National Education Association (*q.v.*), consisting of 120 members, elected from the active and life members of the association, and for six-year terms. One half of the membership is elected by the Board of Directors of the National Education Association, and the other half by the council itself.

The first proposal for the formation of such a body was made in 1879 in an editorial in the *National Journal of Education* of Boston. The article awakened much interest, and a number of State Teachers' Associations indorsed the idea. The editor was invited to read a paper on the subject before the Department of Superintendence of the N.E.A., at its winter meeting in 1880, and a committee was later appointed to draw up a plan of organization, to be reported to the directors of the N.E.A., at the summer meeting. The plan was approved by the directors and by the association, and the first council was appointed in that year. Since then there have been some changes in the plan and constitution, and a material enlargement of the membership, but the purpose of the organization, as stated in its constitution, has remained with but little change. The membership was soon enlarged from the original 51 to 60, at which it remained until the Cleveland meeting in 1908, when it was increased to 120.

The National Council was intended to be a small body of the older and more deeply interested members of the association, who should not only meet for the more serious consideration of fundamental educational questions but should also direct investigations and conduct research. The appointment of special committees for this purpose was distinctly authorized in the articles of organization. The council was also to recommend educational questions or the results of investigation to the directors of the National Education Association for their consideration, and was to make a report to the association on the work of the council for the year. The recording and reporting of current educational progress was to be a part of its work. During the first twenty years of its existence the council rendered valuable service, and the record of its discussions shows that the members considered most of the important topics of the day. Many short but important individual reports were made by members and considered. The *Report of the Committee of Twelve on Rural Schools*, submitted in 1897, and the *Report of the Committee on the Relations of Public Libraries to Public Schools* made in 1899, were longer coöperative studies. During the past ten years, however, the council has considered few problems of fundamental importance.

This plan for a Council of Education has been copied in more or less detail by a number of State Teachers' Associations, and in a few associations such a body is still rendering important service. The difficulty which confronts such a selected body is that, under the democratic methods of election which prevail, and with election open to all members, persons are elected to the councils because of other considerations than ability and willingness to work, the membership is enlarged to make place for others, and the council loses its early vigor and usefulness. E. P. C.

NATIONAL EDUCATION. — The different aspects of this problem will be found distributed under various topics; *e.g.* ENGLAND; EDUCATION IN; FRANCE, EDUCATION IN; GERMANY, EDUCATION IN; SCOTLAND, EDUCATION IN; and other national systems, where the development of public education is given under the historical sections. For this country see under COLONIAL PERIOD IN AMERICAN EDUCATION; MASSACHUSETTS, STATE OF; and the historical sections of the articles on the other state systems, *e.g.* ALABAMA, STATE OF. See also DEMOCRACY AND EDUCATION; CITIZENSHIP AND EDUCATION; FAMILY EDUCATION; SCHOOL AND LIFE; COURSE OF STUDY, THEORY OF; COURSES OF STUDY, etc., and the articles on the more recent developments in special fields of AGRICULTURAL EDUCATION; COMMERCIAL EDUCATION; INDUSTRIAL EDUCATION. See further ATTENDANCE, COMPULSORY; CHILD LABOR; CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF, etc. The general development of the principle of public education is treated under FREE SCHOOLS; see also in this connection FEES; the general method of support is outlined under TAXATION.

NATIONAL EDUCATION ASSOCIATION. — See TEACHERS' VOLUNTARY ASSOCIATIONS.

NATIONAL GOVERNMENT OF THE UNITED STATES AND EDUCATION. — The whole policy of national aid has been a slow and a gradual development, but following a slowly evolving plan. The organization and control of the educational systems themselves have been left to the states, the national government merely aiding and encouraging the states by granting them educational endowments from the vast national domain. As a total the aid granted has been large, but it has been unevenly distributed.

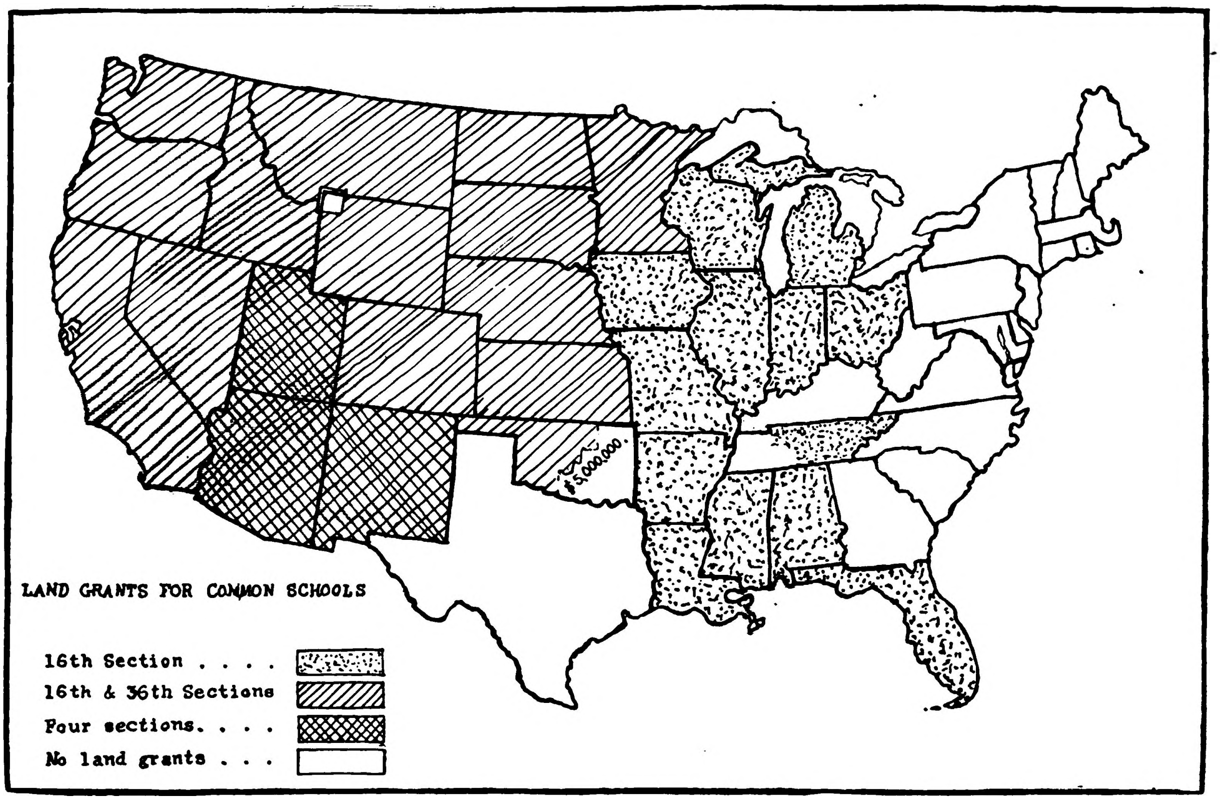
The large national domain was acquired as the result of state cessions, purchase, treaty, and the fortunes of war. The cessions west of the Allegheny Mountains and east of the Mississippi River, made by the original states between 1780 and 1802, formed the beginning of the national domain. This was added to by the Louisiana Purchase of 1802, the Oregon boundary treaty settlement of 1846, and the outcome of the war with Mexico, in 1848. After the consideration of a number of proposals, the Continental Congress, in 1785, adopted a system of rectangular land survey for the new domain, based in large part on the old New England system of "town planting," which, after slight modifications, was adopted in final form in 1796, and is known as the Congressional land survey. Under it the national domain has been laid out into rectangular townships, six miles square, and these have in turn been divided into sections, one mile square. From this form of survey the lands have been sold and the endowment grants made.

Land Grants for Common Schools. — *Disposal of the Lands.* — In April, 1783, Colonel Timothy Pickering drew up certain propositions for settling a new state in the national domain, in what is now Ohio, the same to be settled by officers and soldiers of the federal army. The proposal of Pickering is significant as containing the earliest suggestion of national land grants for education, as follows: —

> "Art. 7. These rights being secured, all the surplus lands shall be the common property of the State, and be disposed of for the common good; as for laying out roads, building bridges, erecting public buildings, establishing schools and academies, defraying the expenses of government, and other public uses."

Two years later the Ordinance of 1785, ordering the rectangular system of survey, contained a provision that "there shall be reserved the lot No. 16 of every township for the maintenance of public schools within the said township." The famous Ordinance of 1787 merely stated in principle, for the entire Northwest Territory, what had been specifically provided for in a part of Ohio in 1785.

In 1787 a New England company, known as "The Ohio Company of Associates," purchased 1,500,000 acres of land on the Ohio, and in arranging for this sale Congress agreed with the purchasers to reserve Section 16 in every township for schools, and Section 29 for religion; and to grant, in addition, two complete townships for the benefit of a university. The university lands were given to the care and management of the legislature of the future state, but the control of the sections for schools and religion was left undecided, Similar terms were made in the contract for the sale of 1,000,000 acres on the lower Ohio to John C. Symmes in 1788. In these laws and grants by the Congress of the Confederation may be seen the beginnings of a national land-grant policy, though it was some years afterward before a settled policy may be said to have been determined upon. On the organization of the National Government in 1789, many petitions were presented to the new Congress for special grants of land and for the sale of land at reduced prices, and it is greatly to the credit of the Congress that it consistently refused to make additional concessions. The new Congress also refused to grant lands to the Ohio Company in lieu of those of Section 29 (religion) which were found to have been sold, and the grant of sections for religion nowhere appears again. In 1792 the new state of Kentucky and in 1796 Tennessee were admitted to the Union, but no land grants were made to them.



Ohio establishes a Type and a Policy. — With the admission of Ohio, in 1802, our land-grant policy for education really begins. A definite precedent was here established, which has been followed, and extended, in the admission of all subsequent states. The enabling act for the admission of Ohio contained a definitely proposed bargain, which, if accepted by the state, was to be binding on Congress, and irrevocable. If the new state would agree by ordinance to exempt from taxation all public lands sold by Congress within the state, for five years after sale, Congress agreed to give to the new state certain salt springs; to give to the state 5 per cent of the net proceeds of the sale of all public lands within the state; and to give the 16th section for schools to the inhabitants of each township. This was a definite exchange of property and rights of value, and Congress was actuated as much by a desire to increase the market for national lands as it was to aid in the establishment of schools. Nevertheless, this bargain inaugurated a policy which was followed in the admission of subsequent states, even after the taxation exemption provision was dropped.

In 1803 Congress confirmed to Ohio all preceding grants for schools; extended the grants to certain reservations not before included; granted the state another township for a university; declared the grants "to be for schools, and for no other use, intent, or purpose whatever"; and vested the control of the school lands in the legislature, in trust for the purposes mentioned. The same year the provisions of the Ohio act were extended to the territory "south of the state of Tennessee," and in 1806 Congress, in settling a dispute with Tennessee, provided for the reservation of "640 acres to every 6 miles square" for schools, and granted the state, in return for certain concessions, 100,000 acres for academies and a like amount for two colleges. With the admission of Indiana in 1816, Mississippi in 1817, Illinois in 1818, and Alabama in 1819, bargains and grants similar to the one for Ohio were made by Congress. With the admission of Missouri in 1821 the grants for schools were extended to the Louisiana Purchase, as well as to the national domain derived from the state cessions. Louisiana had received no grant of school lands on its admission in 1812, but in 1834 the 16th section was granted the state, "wherever the same had not been sold." All states thereafter admitted received grants of lands for schools, with the exception of Maine, which was carved from Massachusetts; Texas, in which the national government owned no land; and West Virginia, which was carved from Virginia.

Three Types of Grants; Leases. — Three types of grants were used before 1840. In the Ohio type of grant the 16th section, or its proceeds, was "granted to the inhabitants of each township, for the use of schools." Indiana in 1816 and Mississippi in 1817 followed the Ohio type of grant. With the admission of Illinois in 1818, the 16th section was "granted to the state, for the use of the inhabitants of such township, for the use of schools." Alabama in 1819 reverted to the Ohio type of grant, but Missouri in 1821, and Arkansas in 1836 followed the Illinois type of grant. By the time Michigan came to be admitted in 1837, the evils of both forms of grants had become so apparent that the convention which framed the constitution memorialized Congress to grant the 16th section lands "to the state, for the use of schools," and to be applied without reference to township lines. To this Congress assented, and this wise form of grant has been followed in the case of all subsequent states. By about 1850 the policy of making grants for schools had become settled, and after that time the reservations were ordered at the time the survey of the territory was made, the sections being held in reserve for the future state.

At first there was no permission to sell the school lands, and they were held under lease. This proved unprofitable, and in 1824 Ohio led the way by memorializing Congress for permission to sell her school lands. This was granted in 1826, and similar permission was soon granted to the other states. This led to much waste and many abuses. Beginning with Colorado in 1876, Congress has imposed increasing restrictions as to the sale price, so as to insure proper returns.

Additional Section Grants. — Up to 1850 all states admitted, beginning with Ohio, had received the 16th section for schools, except Maine and Texas. When the survey of the Oregon country was ordered in 1848, Congress departed from the previous policy and ordered the reservation of sections 16 and 36 in every township for the benefit of schools in the future state or states. California, entering the Union in 1850, was the first state to receive two sections, and two sections were granted to all new states thereafter, except West Virginia, up to 1896. When Utah was admitted in 1896, four sections in each township, the 2d, 16th, 32d, and 36th, were granted to the state for schools, and this form of grant was also followed in the admission of Arizona and New Mexico. In admitting Oklahoma in 1907 the most liberal of all grants was made. The state was granted the 16th and 36th sections for schools; the sum of $5,000,000 in money, in lieu of grants in Indian Territory lands; section 13 for normal schools, the agricultural college, and the university; section 33 for charitable, penal, and reformatory institutions; and other acreage grants for individual institutions mentioned further on in this article.

Value of these Grants. — The total of these land grants for common schools is about 81,064,300 acres. This is equal to an area about the size of the states of Ohio, Indiana, and Illinois combined, and, at the traditional price of $1.25 per acre for government land, would be worth about $100,000,000. As a matter of fact, the grants have produced much more than this amount, the sale price of lands in the newer Western states being many times the old figure. Many of the earlier grants were grossly mismanaged, and in some cases the money when accumulated was borrowed by the state and spent, leaving to-day only "a perpetual obligation" on which the state pays interest from the proceeds of general taxation. In the states admitted since 1850, however, the land grants have been looked after with greater care, and since 1875 excellent results have been obtained. The accompanying map shows the distribution of the grants, and the following tabulated summary shows the approximate values of them. That a total permanent school fund of $500,000,000 may in time be obtained from these school-section grants seems probable, while the amount may eventually prove still larger. Of this estimate of $500,000,000 but $6,000,000 is in the old slave states; $35,000,000 is in Oklahoma; $27,000,000 is in the old

Northwest Territory states, two fifths of which is land belonging to the city of Chicago; $157,000,000 is in the Plains states; $205,000,000 in the so-called Mountain states; and $72,000,000 is in the three Pacific Coast states.

GROUPS OF STATES	ACRES RECEIVED IN SECTION GRANTS	FUND DERIVED FROM SALE (Approximate)	VALUE OF UNSOLD LANDS (Approximate)
11 states adm. before 1825	6,465,382	$15,250,000	[1] $13,000,000
6 states adm. 1825–1849	4,726,153	8,750,000	1,250,000
8 states adm. 1850–1889	26,223,353	35,500,000	95,750,000
10 states adm. 1889–1912	13,649,412	43,500,000	300,000,000
TOTALS	31,064,300	$103,000,000	$410,000,000

[1] Three fourths of this amount is land belonging to the city of Chicago.

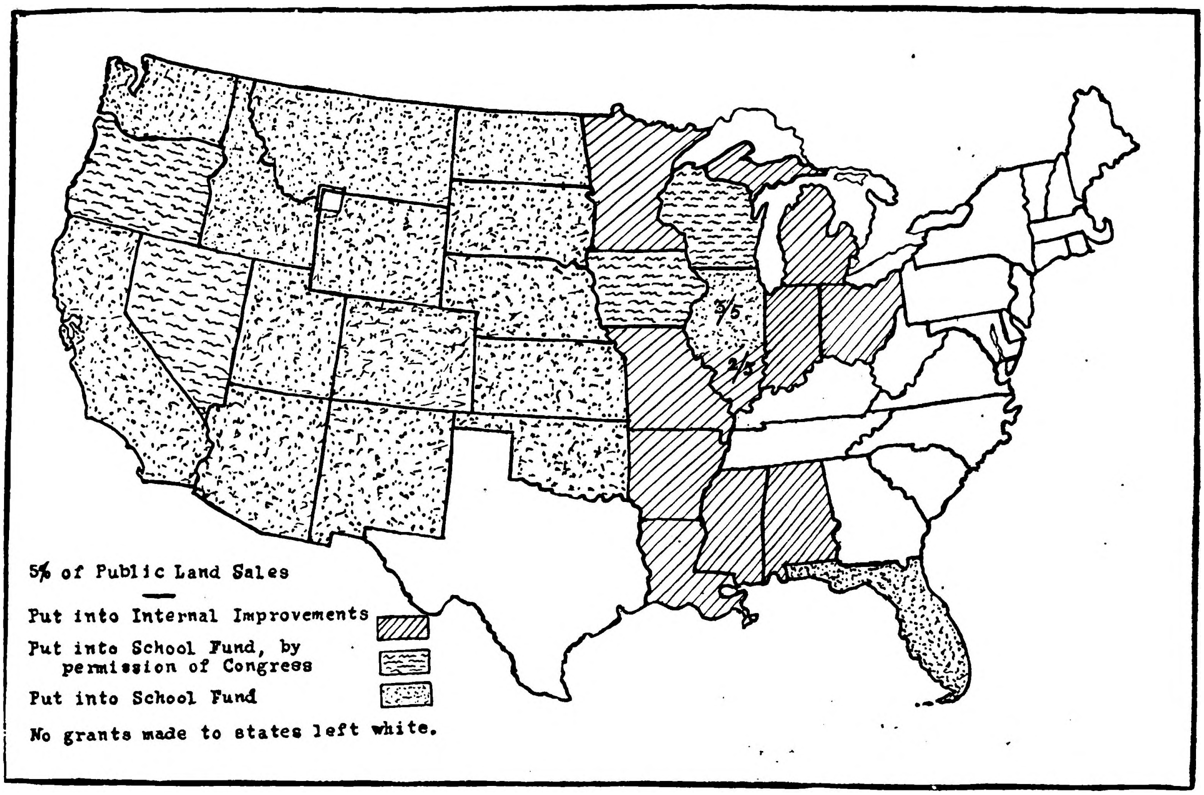
Protests of the Older States. — It will be noticed from the map of the United States, showing the distribution of these land grants for common schools, that certain states received no grants for schools whatever. This has for long been a source of dissatisfaction and protest on the part of the older states. Maryland in 1821 drew up a long and detailed statement, which it transmitted to Congress and to each of the states, setting forth the facts as to the grants; declaring that each state in the Union had " an equal right to participate in the benefit of the public lands, the common property of the Union "; and requesting Congress to make similar appropriations of land to each of the other states. The legislatures of Maine, Vermont, New Hampshire, Connecticut, Rhode Island, New Jersey, Delaware, and Kentucky indorsed the Maryland memorial and also transmitted to Congress carefully prepared memorials praying for similar grants for common schools. Ohio alone among the states opposed the grants. The Committee on Public Lands of the Senate was " instructed to inquire into the justice and expediency " of making such grants, and reported adversely, holding that the so-called grants had in reality been " sales bottomed on valuable considerations," and that to grant large areas of land to other states would greatly impede the development of the states in which the land was located. On the other hand, the committee stated that it would be both " just and expedient to grant a per centum on the sales of public lands for the purpose of promoting education in such states as had not received the aid of the government." This was not done.

The question has come up from time to time, but no settlement has ever been reached. One of the most recent proposals was a bill introduced into Congress in 1894–1895, proposing to give sufficient land to the states to equalize all grants to an equivalence of two sections for all. It was estimated that this would require about 28,000,000 acres, but no action was taken. It can hardly be denied that the older states have not received their just share in these grants from the national domain. That they would have wasted their share had they been given section grants at the beginning, seems probable. The story of the waste of the school lands by the states admitted before 1850, and the squandering of the Surplus Revenue distribution of 1837 by most of the older states, leaves little doubt as to what would have been the result. That these grants have greatly stimulated an interest in education in the newer states to the west cannot be questioned, and it is probable that national grants to the older states, even now, might awaken a new interest in the work of public education.

Other Grants for Common Schools. — *Saline Grants.* — In the bargain made at the time of the admission of Ohio, certain saline lands were given to the state, and these were in turn put into the school fund; 24,216 acres were granted in all, and their final sale added $41,024 to the school fund. Indiana, similarly, received 23,830 acres, from which about $85,000 were derived. Shortly afterward it became customary to grant two full townships of saline lands to each state, on its admission, to be devoted to any purpose the state saw fit, though in the admission of all states after Colorado (1876), except Utah, the grant of saline lands has been omitted. In Utah all saline lands in the state were given to the state for the benefit of the state university. About 900,000 acres of saline lands have been granted to the different states, most of which have been used for educational purposes. Some states have added the proceeds to the permanent school fund, some have used the lands to endow the normal schools, and one or two states have added the lands to the university grants. Just how much these saline grants have produced is not known, but probably something over a million dollars.

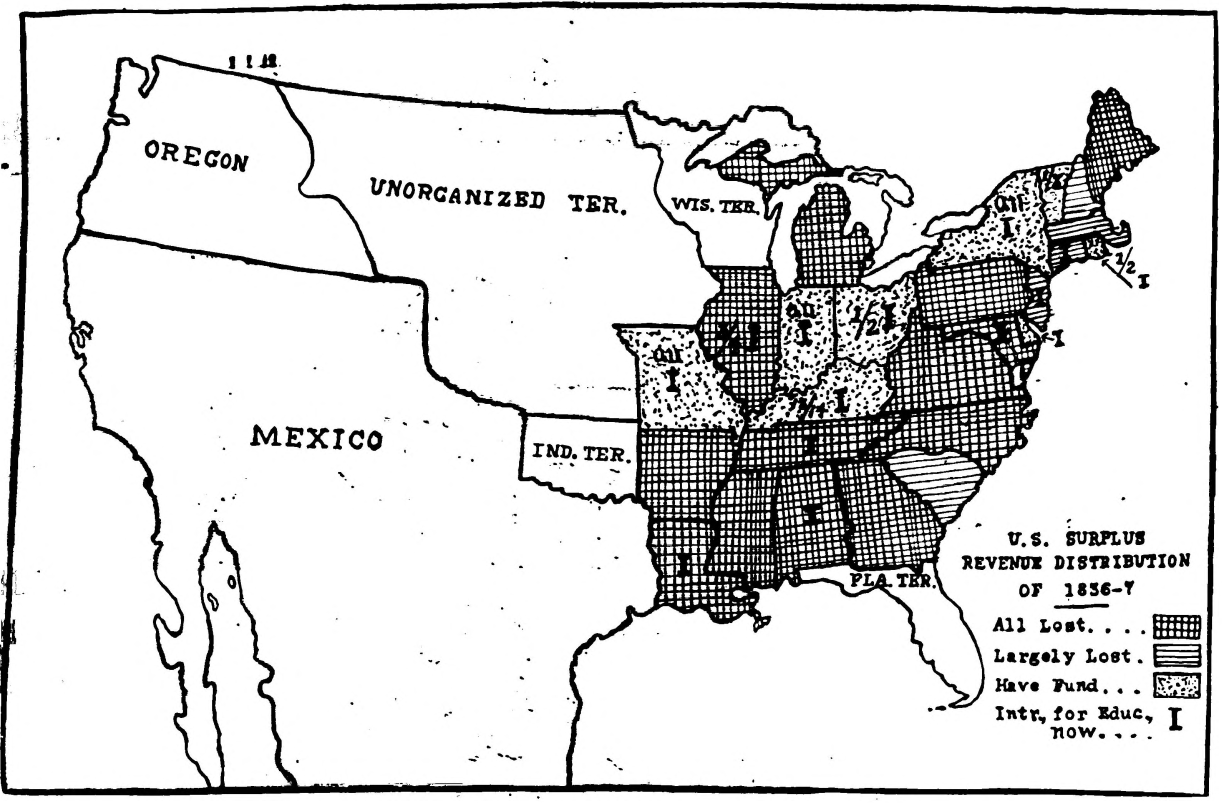
The Five Per Cent Fund. — In the enabling act for the admission of Ohio the plan of granting 5 per cent of the net proceeds of the sale of all public lands lying within the state, for internal improvements, was begun, and has since been continued in the case of all new states, except Maine, Texas, and West Virginia. With the admission of Illinois in 1818, a portion (three fifths) of this fund was for the first time given for education, and was used for the normal university. This state, however, formed an exception, as the fund was not again devoted to education for nearly thirty years. Since 1860 the grant has been uniformly given for additions to the common school fund of the states, and, in the case of all states admitted between 1845 and 1860 except Minnesota, the fund has since been diverted to education, with the permission of Congress. In all $7,187,316 had been added to the permanent school funds of the different new states from this source, up to 1910, and four fifths of this has been to the school funds of states west of the Mississippi River.

The Surplus Revenue. — The idea of devoting a portion of the money derived from the sale of public lands to the cause of education, and of dividing it in some equal proportion among the states, seems to have been often considered. In 1826 the Committee on Public Lands of the House presented a report declaring that the public domain constituted "a common fund for the joint benefit of the states," and recommended a distribution among the states of a portion of the proceeds of land sales for the support of common schools. Between 1817 and 1827 there was an annual surplus of national revenue of from two to six million dollars. By 1827 the extinction of the national debt seemed certain, and, as it was at that time believed that the money could not be spent, constitutionally, for internal improvements, visions of a great annual surplus began to appear. As early as 1826 a bill to distribute $5,000,000 among the states was proposed. The bill failed to pass, but the idea was cherished. In 1831 the legislature of Pennsylvania asked Congress for a distribution. In 1833 Clay's bill for the distribution of the land revenues among the states was passed, but vetoed by President Jackson. The money was to be used for education, internal improvement, colonization, or the extinction of state debts. The matter soon became a political issue, and a feeling of injustice on the part of the old states ran through it all. Finally, in 1836, the distribution so long talked about was made; though, to avoid a presidential veto, it was put in the form of "a deposit of money amony the states." After reserving $5,000,000, all money remaining in the Treasury on Jan. 1, 1837, was to be deposited with the states, in proportion to their representation in Congress, and in four equal quarterly installments. Only three payments were ever made, as the panic of 1837 soon left the Treasury empty. Altogether, $28,171,453.86 was "deposited," the deposit varying from $286,751.49 to Delaware, to $4,041,520.71 to New York. The deposit was everywhere regarded as a distribution, and none of the money has ever been called for. Of the total amount distributed, approximately $7,500,000 actually exists to-day, the interest on all of which is devoted to schools. Over half of this amount is that of New York. There is also an interest charge, in eight states, on $6,405,837.74 of lost funds, raised by taxation and now devoted to the support of schools. The school funds of the different states actually received about one fourth of this distribution, and to-day draw interest on about half of it. Almost all of the deposit not put into school funds was squandered or lost.


3/5
2/5
5% of Public Land Sales
Put into Internal Improvements ▨
Put into School Fund, by permission of Congress
Put into School Fund
No grants made to states left white.

The Internal Improvement Act of 1841. — One section of this law (8) has been of much importance to education. By its terms, 500,000 acres of public land were granted to each state admitted after 1800, except Maine, to be selected by the state, and the same grant was made to all new states admitted thereafter up to 1889, except Texas and West Virginia.

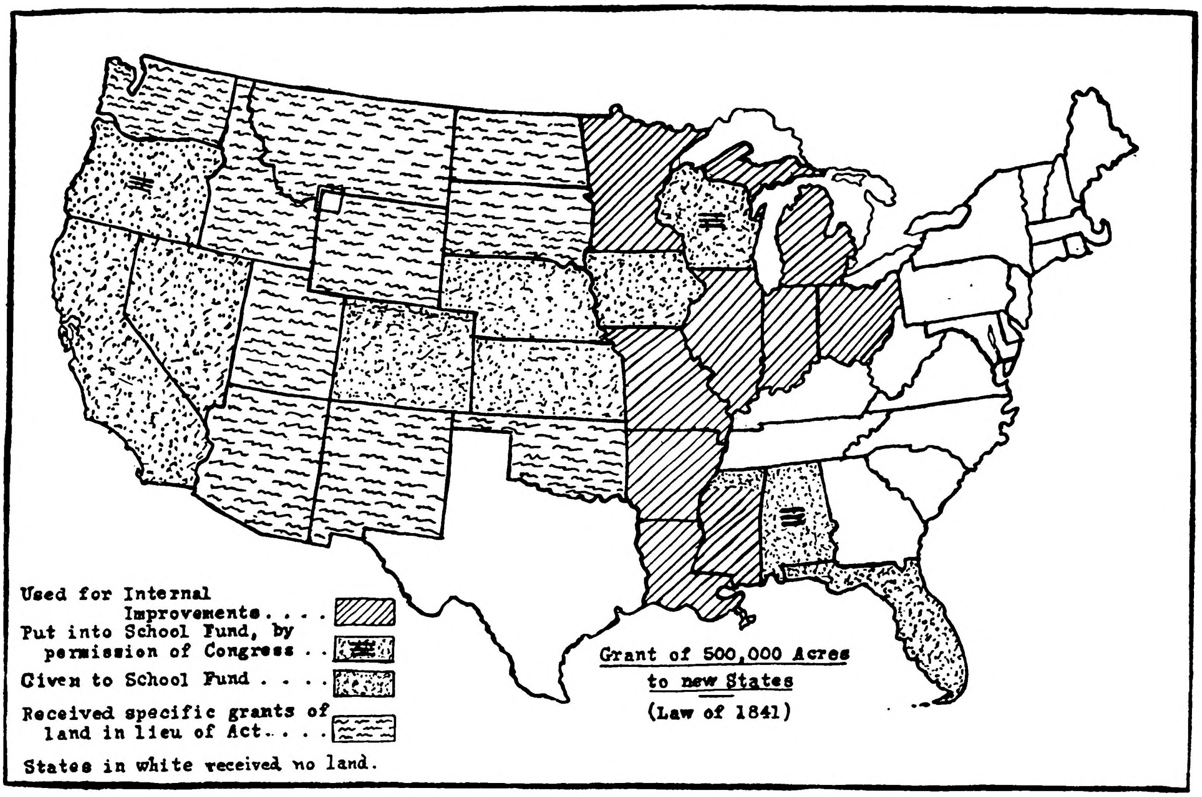
The land was at first given for internal improvements, but after 1845 the grant was diverted to education in all cases except Minnesota. Beginning with the states admitted in 1889 and after, Congress has made important specific grants, ranging from 500,000 to 2,160,000 acres, to each new state in lieu of this and the salt land grants. A brief statement of the amount and approximate value of these 500,000 acre grants to new states, made under the provisions of the law of 1841, is as follows: —



1. General grants made to the states admitted before 1889. Put into the common school funds of the states, 5,000,000 acres. Minimum sale price fixed by law, $1.25 per acre.
   Lands sold so far (about ⅔) have produced about $6,000,000
   Lands still on hand, probably worth about $8,000,000
   Total gains to common school funds from grants up to 1889, about . . $14,000,000.
2. Specific grants for educational purposes, 1889 and since, in lieu of the 500,000 acre grant for schools: — For universities, 1,040,000 acres; for schools of mines, 680,000 acres; for agricultural colleges, 1,000,000 acres; for normal schools, 1,260,000 acres; for schools for the deaf, dumb, and blind, 560,000 acres; for reform schools, specifically, 230,000 acres; for reformatory, penal, and charitable institutions, 1,180,000 acres; and in Oklahoma Section 13 (706,540 acres) was granted, ⅓ for normal schools, ⅓ for the university, and ⅓ for the agricultural college. Other specific grants have been for such purposes as insane asylums, public buildings, penitentiaries, hospitals, and irrigation. On most of this land a minimum sale price of $10 an acre was placed, and in most of the states the sales have averaged two to five times this amount. In Arizona and New Mexico certain lands cannot be sold for less than $25 an acre. The total of all the specific grants to the last ten states admitted is 11,243,080 acres. Of this amount 6,656,540 acres have been for purposes specified above as educational. The educational lands granted to the last ten states are worth from $40,000,000 to $60,000,000, at least.

Swamp Land Grants. — In 1849 Congress granted to the state of Louisiana, on its application, all of the swamp and overflowed lands within the state, the proceeds to be used in constructing levees and drains. The following year the law was made general, and many states have shared. The act applied only to the new or public-land states. In 1857 all lands so far selected were confirmed to the states. In 1860 Minnesota and Oregon were granted swamp lands, and in 1866 California received such grants. Since that date the grant has not been made to any new state. A number of the states have used this grant, or the balance after paying for drainage work, for education instead of for internal improvements, and have put either all, or the net proceeds, into the permanent state school fund. Illinois, for example, has received much of its permanent school fund from this source, if we omit the lands in the city of Chicago. A total of something over 60,000,000 acres of swamp lands was granted to the states, about three fourths of which grants were devoted to educational purposes, and mostly put into the common school funds. These have probably brought in from $12,000,000 to $15,000,000 for educational purposes. Perhaps two thirds of this amount is in existence to-day, some of it having been spent by the states, and an interest charge being all that is left. Some swamp lands are still unsold.

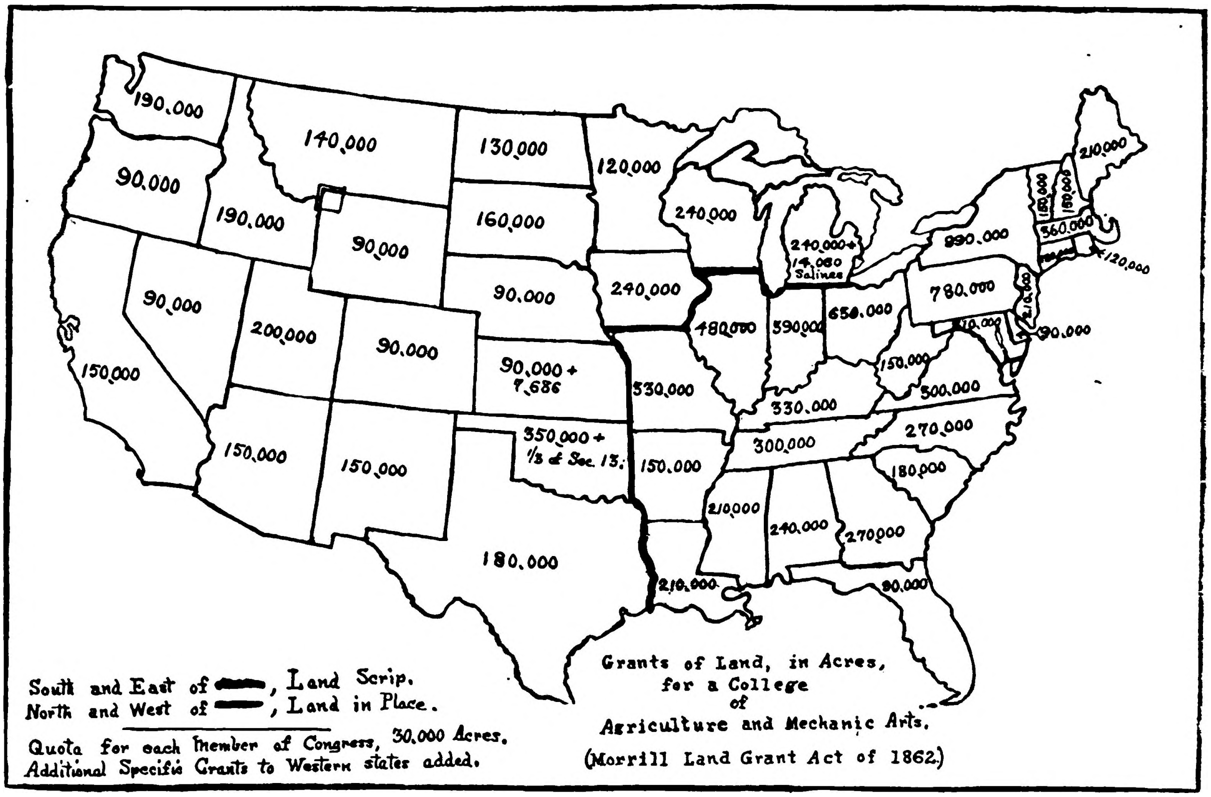
Forest Reserve Income. — By an act of Congress in 1908, Congress now makes grants of 25 per cent of the income of each national forest reserve, for the benefit of schools and roads within the county in which the forest reserve is located. This grant produced $438,702 in 1909–1910, and in time will produce very substantial incomes for certain counties having national forest reserves within their borders.


Used for Internal Improvements . . . . ▨
Put into School Fund, by permission of Congress . .
Given to School Fund . . . .
Received specific grants of land in lieu of Act . . . .
States in white received no land.
Grant of 500,000 Acres to new States (Law of 1841)

The National Aid Policy as Finally Evolved. — Starting from a form of bargain for the sale of land, the policy of making grants for educational purposes has gradually evolved into one of very marked proportions. Perhaps the pressure of the new states for grants for educational purposes has done more to bring these educational grants about than has the desire of Congress to help education in the states. The 16th and succeeding section grants were given for schools from the first, but the form of grant was finally evolved under a request from a state. The 5 per cent fund was at first given for internal improvements, but was gradually diverted to education. The swamp land grants have been devoted to educational purposes by the states without suggestion from Congress. The 500,000 acre grant was changed in purpose, on the request of a number of the states. Such of the saline-land grants and the deposit fund as went to education was so devoted by the states.

Between 1867, when Nebraska entered the Union, and 1889, but one state (Colorado, 1876) was admitted. When Congress came to admit the two Dakotas, Montana, and Washington in 1889, and Wyoming and Idaho in 1890, the national aid policy, as it had finally evolved, is seen. The two sections in each township in the state (Indian reservations excepted) were granted to the state for common schools; the 5 per cent fund was also granted to be devoted to the same purpose; and, in lieu of the swamp land grants and the 500,000 acre grant, 500,000 acres of land, to be located by the state, were granted for specific educational objects, such as the university, the agricultural college, normal schools, a school of mines, reform schools, deaf and blind asylums, and charitable and reformatory institutions. A minimum sale price of $10 per acre was fixed, freedom from sectarian or denominational control for all schools was required to be pledged by the state, and the state was required to pledge the inviolability of all the educational grants. These grants reached a climax in the enabling act for Oklahoma in 1907, and attained a scale of munificence equaled nowhere else. (See special articles on OKLAHOMA, STATE OF, for a detailed statement of these grants; on the other state school systems, for a statement of their grants, and the amount of their permanent school funds; and on **New Mexico, State of**, for a statement of the grants made to Arizona and New Mexico.) The grants to Oklahoma totaled 3,876,163 acres, estimated as worth $20 per acre as a minimum. This is an area three fourths as large as the state of Massachusetts.

One new feature of all the recent (since 1889) enabling acts is the grants of land for normal schools, asylums for the care of defectives, and charitable and penal institutions. A few states, still earlier, devoted certain of their land grants to the endowing of normal schools, but it is only since 1889 that direct grants for these schools have been made by the National Government. In all, something over a million and a half acres of land have been used to form endowment funds for normal schools. This is equal to an area of about one third the size of the state of New Jersey. Of this, 95 per cent has been in the ten states admitted since 1889, only two of which are east of the Mississippi River. Each of these new states should derive a fund from the grants of at least $1,000,000 for the endowment of its normal schools, while Oklahoma should exceed twice that sum.


190.000
90.000
140.000
190.000
130.000
120.000
160.000
90.000
90.000
200.000
90.000
150.000
90.000
90.000 + 7.686
150.000
150.000
350.000 + 1/3 of Sec. 13.
180.000
240.000
240.000
240.000 + 14.080 Salines
480.000
590.000
650.000
530.000
150.000
330.000
300.000
210.000
240.000
270.000
210.000
90.000
270.000
180.000
500.000
150.000
990.000
780.000
210.000
150.000
150.000
210.000
560.000
120.000
90.000
210.000

South and East of ▬, Land Scrip.
North and West of ▬, Land in Place.

Quota for each Member of Congress, 30.000 Acres.
Additional Specific Grants to Western states added.

Grants of Land, in Acres, for a College of Agriculture and Mechanic Arts. (Morrill Land Grant Act of 1862.)

Aid to Higher Education. — *Seminary Township Grants.* — The ordinance, passed in 1787, for the sale of 1,500,000 acres of land to "the Ohio Company of Associates," made the first grant of two townships for a university. On the admission of Ohio as a state in 1802, the three townships, previously granted for purposes of seminaries of learning, were confirmed to the state. In 1806 Tennessee was granted 100,000 acres of land for two colleges, and a similar amount for county academies. The enabling act for Indiana in 1816 granted the state two townships "for a seminary of learning," and vested their control in the legislature of the state. The enabling acts for nearly all of the public land states admitted since have contained similar grants, and, when omitted from the enabling acts, equivalent grants have been made at some other time. All states have received two townships (72 sections; 46,080 acres), and a few have received a larger amount. Beginning with the states admitted in 1889, Congress has, in each case except Wyoming, made specific grants in addition to the state university, and often also for a school of mines as well. In the case of Oklahoma one section of land was granted in each township (Section 13) for the further endowment of the university and the state preparatory school (one third), the agricultural college (one third), and the normal schools (one third). A total of about three and a half millions of acres of land has been granted to the states for university purposes, not including the grants for colleges of agricultural and mechanic arts, to be mentioned further on. This is equal to an area of about two thirds the size of the state of Massachusetts. These grants have produced actual funds of about $5,000,000, and unsold lands have an approximate value of. $25,000,000 to $30,000,000, and may produce much more. Nearly all of the unsold land is in states to the west of the Mississippi River.

The accompanying map shows the distribution of these grants. The old states, it will be noticed, have never shared in these grants. From time to time proposals to make grants of land to the old states as well have been up for consideration. In 1819 the Committee on Public Lands of the House was instructed "to inquire into the expediency of appropriating 100,000 acres of land to each state, for the endowment of a university in each state." They reported against the plan, largely because of the disturbance in land prices which would be produced and the conflicts which would arise between states from the location of the grants. If such aid were to be granted the committee was of the opinion that "it should be given in money." These are the same objections which were urged against the Maryland proposal in 1821, and against all other similar proposals up to 1862.

The Land Grant Colleges. — In 1850 Michigan petitioned Congress for a grant of 350,000 acres of public land to aid the state to endow a college for the teaching of agriculture, but the grant was refused. In 1858 Michigan renewed the petition, and in 1859 a bill making such a grant finally passed both houses of Congress. The bill granted to each state 20,000 acres of public land for each senator and representative in Congress, to which the state would be entitled by the census of 1860, to be used in founding a college for instruction in agriculture and mechanic arts. The bill was opposed by the Southern members, and was vetoed by President Buchanan, in a message which is an interesting summary of the old objections to such grants. In 1862 a bill drawn on similar lines, except that the grant was raised to 30,000 acres for each member in Congress, and instruction in military science and tactics was added, was passed and signed by President Lincoln. This was the famous Morrill Land Act. By subsequent legislation the time for accepting the grant was extended to 1869, and the time for opening the colleges to 1874. States yet to be admitted, and states which had been in rebellion, were specifically included in the grants. In all, including additions made by recent enabling acts, a total of 11,367,832 acres has been granted for colleges of agriculture and mechanic arts as a result of the new policy inaugurated in 1862. This is an area half as large as the state of Indiana. The map shows the distribution of the grants, and it will be seen that for the first time the old states received a share. Eighteen states added the endowment to that of their state universities, and combined the two institutions into one. Four states gave the grant to private colleges or universities already established within the state. The remaining states founded separate higher institutions of learning. (See special article on AGRICULTURAL EDUCATION.)

The financial returns from this large grant of land for higher education have been very disappointing, although the educational returns have been large. A compilation from the most recent returns (1910) gives the following as the results of the grant: —

Total acres granted, law of 1862, and subsequent grants	11,367,832
Total acres sold to date	9,570,401
Total funds produced from the lands sold	$13,736,178
Total annual income from these funds, for all colleges	$823,400
Acres of land still unsold, mostly western	1,797,431
Estimated value of these unsold lands	$15,020,300
If sold for estimated value, total funds would be	$28,756,478

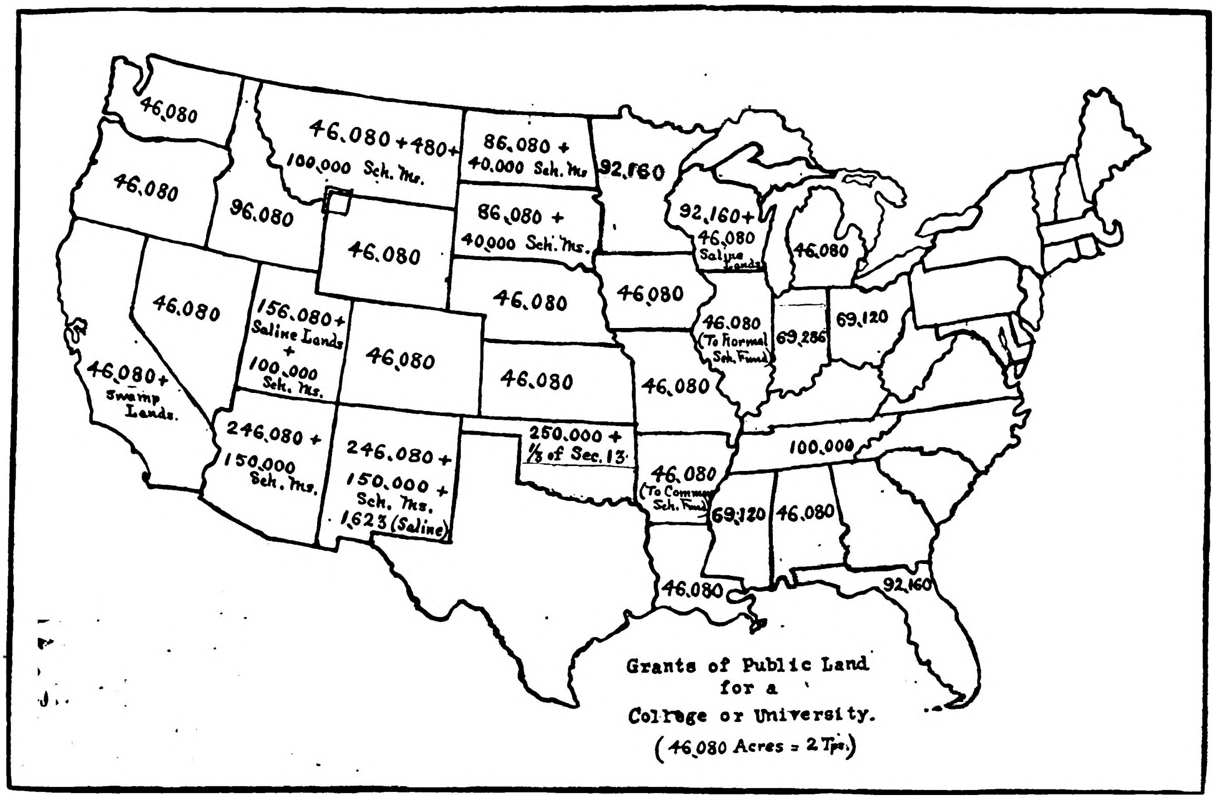
This total is distributed as follows: —

The 28 states to which land scrip was issued, received	7,940,000 acres
These states still have unsold	47,600 acres
The fund produced in these states is	$6,564,507
Average sale price per acre	$0.83
The 20 states to which lands in place were granted, received	3,653,200 acres
These states still have unsold	1,797,431 acres
The lands sold have produced a fund of	$7,171,671
Average sale price per acre	$3.99
Estimated value, at minimum sale price, of lands remaining unsold	$15,020,300
Probable sale value, between	$25,000,000
and	$35,000,000

It is in the ten states admitted from 1889 on that the large funds in the future are to be expected. Of the 9,500,000 acres granted before 1870, 8,050,000 acres, or 84 per cent, were in land scrip. The result was that all of the states were trying to sell land at the same time, the market was glutted, the price of land dropped to as low as thirty-five cents an acre, and much of it was sold for fifty cents to sixty cents an acre. The low average sale price per acre shows the result.

The results of these grants, educationally, have been quite different. Probably no aid given by the National Government for education has ever proved so fruitful as have these grants for colleges of agriculture and mechanic arts. Instead of causing the states to lean upon the National Government for the support of their educational systems, as feared by President Buchanan, the result has been the opposite. New and vigorous colleges have been created; small and feeble state institutions have been awakened into new life; the agricultural and engineering professions have been developed; and the states have been stimulated to make large and rapidly increasing appropriations to these colleges and to their state universities.

National Money Grants. — In 1887 additional grants were made to these land-grant colleges, and a new departure in the matter of government aid was made. A direct appropriation of $15,000 per year, "from the proceeds of the sale of public lands," was made from the National Treasury to each state for the maintenance of an agricultural experimental station, to conduct "researches or experiments bearing directly upon the agricultural industry of the United States." What was for so long regarded as wholly unconstitutional was now accomplished in fact. In 1905 the amount was increased to $20,000, and thereafter to increase by $2000 a year for five years, or until a maximum of $30,000 was reached (which would be in 1910–1911), after which the annual sum should be $30,000. Up to June 30, 1912, a total of approximately $14,424,000 has been paid directly to the states from the National Treasury for experimental work in agriculture. These payments have been so carefully safeguarded that there has been no misappropriation of funds, and the government makes no payments to the states except upon the production of evidence that actual expenditures, for the purposes set forth in the act, have been made.


46,080
46,080
96,080
46,080 + 480 + 100,000 Sch. Ms.
46,080
86,080 + 40,000 Sch. Ms.
86,080 + 40,000 Sch. Ms.
46,080
46,080 + Swamp Lands.
46,080
156,080 + Saline Lands + 100,000 Sch. Ms.
46,080
46,080
246,080 + 150,000 Sch. Ms.
246,080 + 150,000 + Sch. Ms. 1,623 (Saline)
250,000 + 1/3 of Sec. 13
92,160
92,160 + 46,080 Saline Lands
46,080
46,080
46,080 (To Normal Sch. Fund)
46,080
46,080 (To Comm. Sch. Fund)
46,080
69,286
69,120
100,000
69,120
46,080
92,160

Grants of Public Land for a College or University. (46,080 Acres = 2 Tps.)

The results under this grant proved so beneficial that in 1890 what has often been called "the second Morrill Act" was passed. This act provided for a direct annual grant to each state, for maintenance and for the further support of the agricultural colleges. The grant began with $15,000 a year to each state, and was to increase by $1000 a year for ten years, or until an annual grant of $25,000 was reached. In 1907 Congress further extended it, and provided that the annual grant, then $25,000, should increase by $5000 per year, until a maximum grant of $50,000 to each state was reached. This will be in 1911–1912. The College of Agriculture in the Territory of Hawaii and the new University of Porto Rico have been admitted to share in these grants, making a total of fifty states and territories eligible, by 1912, for total grants of $80,000 a year, or a total annual cash appropriation to the agricultural colleges of $4,000,000. Up to June 30, 1912, the total cash grants under this latter appropriation have amounted to $23,920,000, and under both forms of grant to approximately $38,000,000.

Certainly no grants which the National Government has made to the states for educational purposes have been so well administered as the agricultural grants, and probably no grants have given so large a return in the advancement of scientific knowledge or the general welfare of the nation. This has been in part due to better restrictions imposed by the National Government in making the grants, and in part to the fact that the grants have been handled by the colleges themselves, and not by the legislatures of the states.

Proposals for Additional Grants for Public Schools. — The excellent results obtained from the grants to the agricultural colleges have, within recent years, inspired a number of proposals to extend such money grants to other forms of public education. The "Davis Bills," which have been before Congress in recent years, have proposed to grant national aid "for agricultural and industrial instruction in secondary schools, for normal instruction in agricultural and industrial subjects in normal schools, and for branch agricultural experimental stations." So far none of these bills have succeeded in passing Congress, owing to opposition to the endowment of one class of high schools to the exclusion of other kinds of such schools.

Total of National Grants for Education. — While education has received but an insignificant fraction of the money appropriated for all purposes by the National Government, the total amount, spread over more than a century of our national life, has in itself been rather large. Briefly summarized, it has been about as follows, though in a number of cases the figures given are not exactly accurate, but rather the nearest possible approximations.

Grant and Purpose	Acres Granted	Fund Derived from Sales	Probable Future Income[1]	Total Income
1. *For Common Schools:*				
Sections for Schools	81,064,300	$103,000,000	$410,000,000	$513,000,000
Saline Grants	c. 900,000	c. 1,000,000		1,000,000
Five Per Cent of Land Sales		7,187,316	c. 7,000,000	14,000,000
Surplus Revenue		c. 14,000,000		14,000,000
Internal Imp. Act	5,000,000	c. 6,000,000	c. 8,000,000	14,000,000
Swamp Land Grants	c. 45,000,000	c. 15,000,000	c. 2,000,000	17,000,000
Forest Reserve Per Cent		c. 1,000,000	c. 25,000,000[1]	26,000,000
Totals	c. 131,964,300	c. $147,187,316	c. $452,000,000	$599,000,000
2. *Aid to Higher Education:*				
University Grants	3,407,643	c. 5,000,000	c. 27,500,000	32,500,000
Land Grant Colleges —				
Grants of Land	11,367,832	13,736,178	c. 25,000,000	39,000,000
Exp. Station Grants		c. 14,000,000	30,000,000[1]	44,000,000
Laws 1890 and 1907		23,920,000	62,500,000[1]	86,420,000
Totals	14,775,475	c. $56,656,178	c. $145,000,000	$200,920,000
3. *Grants for Other Types of Schools:*				
Normal Schools	c. 1,500,000	c. 2,500,000	c. 17,500,000	20,000,000
Deaf, Dumb, and Blind	560,000		5,600,000	5,600,000
Reform Schools	c. 500,000		5,000,000	5,000,000
Totals	2,560,000	c. $2,500,000	c. $28,100,000	$30,600,000
4. *Summary of Grants*	c. 149,299,775	206,343,494	725,100,000	829,520,000

[1] Calculated for twenty years into the future, at present rate of increase.

The land grant policy was begun in the days when land was about all that the National Government had to give; the money grants represent a much later development.

E. P. C. and E. C. E.

See also the article on National Teaching Institutions, and the types of schools and institutions referred to in the text, especially Agricultural Education; Technical Education, etc.; the article on State vs. National Education deals with the development of state education; see further articles on the individual state systems, *e.g.* Alabama; Arkansas, etc. For the relations between governments and education in foreign countries see the articles on the national systems, *e.g.* England, Education in; France, Education in; Germany, Education in.

NATIONAL TEACHING INSTITUTIONS OF THE UNITED STATES GOVERNMENT. — In addition to aiding education in the various states (see special article on National Government and Education), the National Government maintains a number of teaching and other institutions of an educational nature, and has rendered assistance in the establishment of education in the territories apart from the mainland. These may be mentioned briefly here, and reference made to other articles in which a more detailed statement is made on the different institutions.

In the District of Columbia. — The free public library of the city of Washington, the free public schools of the District of Columbia (*q.v.*), the National Training School for Boys, the Reform School for Girls, and the Industrial Home Schools for both races are teaching institutions maintained within the District of Columbia. Appropriations are also made for the instruction of the deaf, dumb, and blind within the District. The expenses of all of these institutions are met, half by the National Government, and half by the District of Columbia. Under the Department of the Interior, the Columbian Institute for the Deaf and Dumb, and Howard University (*q.v.*), an institution for the colored race, are also maintained by the National Government in the District of Columbia. The Library of Congress (see Congressional Library), in the city of Washington, is another educational institution maintained by the National Government, the appropriation for its maintenance in 1910 being $841,755.18.

War and Navy Departments. — The United States Military Academy (*q.v.*), at West Point, New York State, founded in 1802, is a national college for the training of engineers and officers for the army. The appropriation for maintenance in 1910 was $807,646.06. The Army War College at Washington, the Army Service Schools at forts Leavenworth and Riley, the Army Engineers' School at Washington, and various officers' schools at military posts are all forms of education for the army maintained by the National Government. The total appropriation for all of these institutions, including new buildings, was $2,234,598 in 1910. (See MILITARY EDUCATION.)

The United States Naval Academy at Annapolis, Md., established in 1846, is a national college for the training of officers and engineers for the navy. The Naval War College in Rhode Island and the Naval Training Schools in California, Rhode Island, and on the Great Lakes are also forms of education for the navy maintained by the National Government. The total appropriation for all of these institutions was $1,028,094 in 1910. (See NAVAL EDUCATION.)

Under the Interior Department. — This department maintains a number of educational institutions. The United States Bureau of Education (*q.v.*) is under this department, as well as the Bureau of Indian Affairs. The United States Bureau of Education has charge of the educational work among the Indians of Alaska (*q.v.*), and the Bureau of Indian Affairs has control of the large number of Indian schools maintained by the National Government in the different states. With one exception these schools are located in the Central or Western states. The appropriation for education in Alaska in 1910 was $200,000, and the appropriation for Indian education in the United States was $4,566,021.97. (See special article on INDIAN EDUCATION.)

For a statement of the nature of the educational organization in our island possessions, and the amount of national aid granted, see special articles on the school systems of HAWAII, GUAM, PHILIPPINES, and PORTO RICO.

It will be seen from the above that the educational activities of the National Government have never been organized into any system, but scattered among the different bureaus at Washington, with the result that there is little system or coördination of the educational work of the National Government. In most cases Congress has done its work independently of any organization or advice. E. P. C.

See also SMITHSONIAN INSTITUTION; UNITED STATES NATIONAL MUSEUM.

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NATIONAL HOME READING UNION, ENGLAND. — An organization founded by the late Dr. J. B. Paton (*q.v.*), largely influenced by an article of Bishop Vincent's on "Chatauqua, a popular University," which appeared in the *Contemporary Review* in 1887. The Union was definitely organized in 1889. The purposes in view, as stated in Sadler, *Continuation Schools in England and Elsewhere*, were as follows: —

> (1) To stimulate, encourage and direct home reading in such a way as to make home reading educational in the truest sense of the word. (2) To give definiteness, continuity, and system to home reading, and to adapt it to the divers needs and tastes of readers. (3) To give all practical help, in the most economical and efficient way, to those who engage in such reading. (4) By means of local unions, or associations of readers, and the influences of a large organization, as well as by personal sympathy, to sustain the interest and confirm the purpose of all who undertake a regular course of home reading, and to unite them in honorable and helpful fellowship with each other.

The reading is arranged in three courses: Young People's Section, General Section, Special Supplementary and Introductory Courses. Two magazines, the *Special Courses Magazine* and the *General Course Magazine*, appear monthly and contain articles on books or subjects of interest, reviews, questions, and news. The Union sends out suggestive lists for reading with books of reference available in local libraries, "in art, history, social and political economy, poetry, science, exploration and all the sides of human activity dealt with in literature." The N.H.R.U. encourages the formation of local reading circles for study and discussion of books, and gives assistance to members by correspondence. It seeks to secure the coöperation between teachers in schools and the libraries, and the formation of reading circles among the senior pupils in public schools. The Board of Education in 1905 issued circulars calling upon local educational authorities to pay the expenses of and librarians to aid the organization of reading circles. Many schools and school systems are in active coöperation with the Union, and have adopted its list of readings and have formed reading circles; among these may be mentioned the London County Council, Manchester, Leicester, Glasgow, and many county authorities. Another phase of the work of the N.H.R.U. is the summer assemblies. For a few years its annual meeting was held for ten days at Blackpool. In 1892 a removal was made to Bowness and the Lake District, and since that time the assemblies have been held at points of literary or historic interest, connected in the main with the reading of the year. The Union is associated with the Home Music Study Union. For the purpose of encouraging the wise use of holidays the N.H.R.U. also coöperates closely with the Coöperative Holidays Association (*q.v.*), and many other associations for adult education.

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NATIONAL MONEY GRANTS. — See National Government and Education; School Funds, Permanent.

NATIONAL SOCIETY, ENGLAND. — The success of Joseph Lancaster (*q.v.*) in establishing unsectarian schools, especially after the formation in January, 1808, of a committee to help him, stimulated the bishops of the Church of England to the formation of an association for promoting the establishment of sectarian schools. Lancaster's schools attracted public attention by the novelty of the monitorial system on which they were conducted, and public support by the cheapness which that system rendered possible. In Andrew Bell (*q.v.*) the Church had ready to hand a clergyman eager to be employed in organizing monitorial schools that should rival the others in attractiveness and cheapness while excelling them in orthodoxy. The vague ideas of the bishops were made definite and given a practical direction by a sermon which Herbert Marsh, Lady Margaret Divinity Professor at Cambridge, preached in St. Paul's Cathedral on June 13, 1811.

On Aug. 27, 1811, "a number of gentlemen, friends to the Establishment," met to discuss the question of forming a society, and at a larger meeting held on October 21 the "National Society for promoting the Education of the Poor in the Principles of the Established Church" was actually formed. The Prince Regent (afterwards George IV) "graciously consented" to be the patron, and the Charter of Incorporation, granted in 1817, prescribed that the Archbishop of Canterbury for the time being should be president, and the vice-presidents the Archbishop of York, all the bishops, and ten other persons being either temporal peers or privy councilors.

No time was lost in getting to work. At the end of 1812 the society could report that, with its help and encouragement, 52 schools attended by 8620 pupils had been opened. Next year there were 230 schools with 40,484 pupils. To provide the necessary teachers a model school was started on Holborn Hill, but this was soon supplanted by a much larger one in Baldwin's Gardens, Gray's Inn Lane. Intending teachers did little more there than master the mechanism of the monitorial system, but in the course of years the need of a more thorough training became evident, and the society opened five colleges, three of which (St. Mark's, Chelsea; St. John's, Battersea; and Whitelands, Chelsea) are still in existence.

In 1833 government grants were first given towards the building of schools; in 1846, towards the payment of pupil teachers and the maintenance of training colleges; and in 1853, toward the maintenance of schools. Profiting by these grants in aid of local effort and the local effort which they evoked, the society continued to extend its operations; in 1870 there were 6382 Church schools with an average attendance of 844,334.

By the act passed in 1870, if in any district sufficient school accommodation were not provided by voluntary agencies, a school board must be elected to supply the deficiency at the cost of the district. As board schools would necessarily be unsectarian the National Society made a mighty effort to render them unnecessary by establishing Church schools. The task was too great for the effort to succeed altogether, but it was far from failing altogether; there were in 1902 11,711 Church schools with an average attendance of 1,927,663.

Part of the cost of maintaining both board and voluntary schools had come out of parliamentary grants; the remainder for board schools came out of rates, and for voluntary schools out of subscriptions. The act of 1902 abolished school boards, made the councils of the counties and county boroughs the local education authority, and gave all schools the same support out of rates without depriving the voluntary managers of their power. Some of the councils, objecting to paying toward schools which they were not allowed to control, tried to differentiate in various ways between them and the council schools. The National Society fought the battle of the local managers and by a series of decisions in the law courts obtained equal treatment for their schools.

In 1911 there were 10,952 Church schools with an average attendance of 1,750,094 as against 8006 council schools with an average attendance of 3,962,819. The average council school is thus obviously larger than the average Church school, the reason being that many of the Church schools are in rural parishes and many of the council schools in towns or urban districts. D. Sa.

See England, Education in.

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NATIONAL SOCIETY FOR THE SCIENTIFIC STUDY OF EDUCATION. — See Herbart Society; Education, Academic Study of; Educational Associations.

NATIONAL TEACHERS' ASSOCIATION. — See Teachers' Voluntary Associations.

NATIONAL UNION OF TEACHERS, ENGLAND. — The largest organization of teachers, primarily those engaged in elementary school work, in England. The Union was founded in 1870 as the National Union of Elementary Teachers, but the present title was adopted in 1889, making the association more comprehensive. Among the objects of the N.U.T. in addition to the safeguarding and protection of the interests of members, are the following: —

To improve the condition of education in the country and to obtain the establishment of a national system of education, coördinated and complete; also to secure for all public elementary schools adequate financial aid from public sources, accompanied by suitable conditions.

To afford to the Board of Education and to local authorities for education, and other organizations — public or private — which have relation to educational affairs — the advice and experience of the associated teachers.

To secure effective representation of educational interests in Parliament.

To raise the qualifications and status of teachers and to open to the best-equipped members of the profession the higher posts in the educational service of the country, including the inspectorate of schools.

A Teachers' Provident Society and Teachers' Benevolent and Orphan Fund are maintained. A representative of the Union is supported in Parliament. Legal advice and assistance are given to members. Through an Examination Board the Union issues Teachers' Diplomas in music, manual training, needlework, and dressmaking. The N.U.T. has exercised and continues to exercise considerable influence on the administration of elementary education, the training of teachers, and improvement of codes and regulations, and teaching methods. The membership of the Union in 1910 was 69,073 distributed among 516 local branches, which in turn are grouped into fifty-seven county associations. The membership is gradually being extended among other than elementary teachers. The *Handbook of Education, The Red Code* (annual) are published by the N.U.T., while the official organ of the Union is the *Schoolmaster* (weekly). Sir James H. Yoxall, M.A., M.P., is the secretary.

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NATIONAL UNIVERSITY — The establishment of a national university, created and supported by the federal government and located at the national capital, has been repeatedly proposed and much discussed since the idea was first definitely expressed in 1790. The interest of George Washington was keen and persistent in the proposal to found a federal institution to which American youth would come for their higher education instead of seeking it in Europe, and in which would be gathered students from all parts of the United States, thus fostering that common national feeling which he had seen developed in the Continental army during the Revolution. He referred to the matter of a national university in his first message to Congress, and in his will he gave fifty shares in the Potomac Company, worth at that time about $25,000 toward the endowment of such an institution, provided Congress should " incline to extend a fostering hand toward it." This act Congress has never been persuaded to perform, though urged to do so by Madison, in three messages, by John Quincy Adams and later presidents, and by many other statesmen.

The question of constitutionality was early raised in connection with the proposed establishment. As a " loose constructionist," Washington did not doubt the power of the federal government to provide such an institution; Jefferson and his party took the opposite view, and a congressional committee in 1811 reported that it would be unconstitutional for Congress to found, endow, or control such a " seminary." Even before broad interpretation of the constitution finally triumphed, the practice of Congress in voting money for the establishment and support of the military academy at West Point and the naval academy at Annapolis, and in granting lands to Georgetown University and Columbian University in the District of Columbia, went far to settle the theoretical question of power. A senate committee, first a special " committee to establish the University of the United States " to consider a bill introduced by Senator George F. Edmunds in 1890, and later a standing committee, reported in favor of the creation of such a university in 1893, 1894, 1896, and 1902.

Numerous bills for establishing a national university have been introduced into Congress, some of them widely indorsed by college presidents as well as by statesmen, ecclesiastics, and professional men. The arguments against the proposed institution have been based on belief in its undesirability rather than the lack of constitutional power to create it. In 1899 a committee of fifteen " on the national university project," organized by the National Education Association and including the presidents of Harvard, Chicago, Cornell, Illinois, North Carolina, Michigan, and Washington and Lee universities, agreed unanimously that the federal government should aid, but not control, the educational agencies of the country, that none of the bills presented in Congress was entirely commendable, that "the government is not called upon to maintain at the capital a university in the ordinary sense of that term," and that the most that should be attempted was systematic coöperation in the use of the opportunities for advanced instruction and research offered by the departments and bureaus in Washington.

The arguments for the national university are stated strongly in the appeal of the "national university committee of four hundred" in 1907, in resolutions of the National Education Association, and in the bill proposed by an almost unanimous vote of the National Association of State Universities in 1907. They assume that it is to be a purely graduate institution, coöperating with other universities and colleges, and with scientific departments of the federal government, conferring no degrees, or only the doctorate, and devoting itself wholly to higher instruction and research, to promote the advance of science, pure and applied, the liberal and fine arts, and the national welfare. They declare that it would vivify by its influence every part of the educational system of this country, greatly increase present opportunities without interfering necessarily with any now existing; attract both scholars and students from the widest possible range; enhance scholarship in many fields; and improve the service of the government; and that its right to determine what institutions should be recognized would raise and make uniform the standards of collegiate institutions in the United States without requiring conformity to particular methods or schedules. Much of the equipment ordinarily required for the highest forms of research already exists in Washington through congressional appropriation. The Library of Congress, with 1,500,000 books and pamphlets, and other libraries in departments, numbering almost as many pieces more, including duplicates of those in the Library of Congress; great collections of the National Museum, the Smithsonian Institution, the Medical Museum, the Patent Office, and the Corcoran Gallery; magnificently equipped laboratories of bureaus, such as those of Standards and of Chemistry; the great observatories; the Geological Survey; and opportunities for field service under the most expert direction in every part of the country, — all these are instrumentalities which might be utilized in considerable degree, without interference with their proper service to the public and to the government, by a national university, wisely organized and judiciously directed for instruction and for research. In fact, Congress in 1892 and 1901 opened up the government departments for the purposes of advanced research. It is estimated that the equipment and apparatus thus available represents a valuation of not less than $60,000,000.

Something akin to the organization of facilities for research and instruction here contemplated is already carried on in a very limited, and often incidental, way in the medical schools of the Army and Navy, in the Public Health and Marine Hospital Service, in the bureaus of Standards, Statistics, Plant Industry, Soils, Fisheries, Entomology, and Public Roads, and in the National Botanic Gardens. Certain work done in some of these offices or laboratories has been accepted in partial satisfaction of the requirements for a degree by some of the strong graduate schools. C. K. B.

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NATIONAL UNIVERSITY OF IRELAND. — See Ireland, Education in.

NATIONALITY AND NATIONAL EDUCATION. — See Citizenship and Education; Immigration and Education; National Education; also National Government and Education.

NATIONS. — See Universities.

NATIVISM. — A term applied to the theories according to which the foundations of all knowledge, or else the essential conditions of some branch of experience, are born in or with the mind or agent. It thus has close associations with the terms *a priori*, innate ideas, and intuition (*q.v.*). In psychology the term has come to be applied particularly to those theories which hold that the extensity of space perceptions is an original, native element in some at least of the sensational qualities, in opposition to those theories which hold spreadoutness and depth to be the results of association among qualities themselves lacking spatial quality. The most recent use of the term has been much influenced by modern biological theories of heredity. The old *tabula rasa* conception of sensationalistic empiricism has been made an anachronism by the demonstration of the number and variety of the instinctive nonacquired tendencies. It is only by a figure of speech, however, that these tendencies can be said to be innate in the *mind* — being rather connate with the organism. This conclusion involves quite as complete a reconstruction of the older type of nativism as of the older type of empiricism. The educational importance of the controversy gathers about the question of the relative importance of Nature and Nurture — the relative importance and function of the hereditary tendencies of the organism as compared with the influence of the social and cultural environment. (See HEREDITY.) This question is thoroughly misconceived, however, when treated as a problem of one versus the other. The conditions of the educative growth of an individual are ultimately inherent in the organism, possessing its native tendencies to act and to be susceptible. This fact is all-important in contrast with the belief of a number of eighteenth-century theorists that practice and the influence of economic and political conditions are omnipotent. It is also highly important in showing the necessity of recognizing individual differences of capacity and aptitude. But, on the other hand, the direction given these native powers, the kind of ends for which they become effective, the ways in which they are used depend upon nurture — that is, upon the influence of the social medium consciously and unconsciously exerted. J. D.

See ACQUIRED CHARACTERISTICS; GALTON; HEREDITY.

NATORP, BERNHARD CHRISTOPH LUDWIG (1774–1846). — German educator, the son of a Protestant clergyman, born at Werden in the Rhine province. He studied theology and pedagogy at the University of Halle under A. H. Niemeyer (*q.v.*). In 1798 he received a call as a preacher to the city of Essen, and there took a leading part in the reform of the schools, which were reorganized in accordance with his *Grundriss zur Organisation allgemeiner Stadtschulen* (*Plan of Organization of Common City Schools*, 1804), a work based on the principles of Comenius, Rousseau, and Pestalozzi. From 1809 to 1816 he supervised the schools of the province of Brandenburg, where he did much for the improvement of methods and the education of teachers. In 1816 he returned to Westphalia and for thirty years more remained active in directing the educational and ecclesiastical interests of the province.

His most interesting educational work is his *Briefwechsel einiger Schullehrer und Schulfreunde* (*Correspondence of some School Teachers and Friends of Schools*, 1811–1816), in which he develops his pedagogic principles in the form of personal letters between schoolmen. Another work that may be mentioned is his essay on Bell and Lancaster (1817), in which he shows the superiority of the German elementary school, founded on the principles of Pestalozzi, over the much-advertised Bell-Lancasterian monitorial system. F. M.

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NATURAL HISTORY. — See NATURE STUDY; ZOÖLOGY.

NATURAL METHOD. — The term "natural" has been applied descriptively to methods of teaching in many subjects, frequently as a trade name for textbooks with a particular system of instruction that supposedly avoid artificiality. The term is applied when one of two characteristics is assumed to be present in the procedure suggested: (1) When the method is psychologically based, — *i.e.* takes account of the instincts and normal interests of young children, — it is said to be natural. Such a natural method is opposed to one which is mentally artificial. If words used in spelling are selected and graded according to the needs which develop in the course of the child's attempt to express his own experiences, the method is said to be natural. If the words are chosen and arranged merely from the standpoint of their frequency of usage in adult life, and without regard to personal motivation, the method is artificial. (2) When the method utilized conforms to usual procedure in social life, omitting special pedagogical devices peculiar to schoolroom practice, it is called a natural method. Thus it is contended that full written or oral computation of problems in arithmetic is an unnatural method; while a combined written and mental method of computation is said to be a natural procedure. In recent years the reaction against artificiality of school procedure of every sort has been marked. Teaching practice has tended more and more to take account of psychological lines of least resistance and to avoid modes of work which differ greatly from social practice. Hence naturalistic methods have characterized teaching reform in all the school subjects. H. S.

NATURAL PUNISHMENTS. See REWARDS AND PUNISHMENTS; SCHOOL MANAGEMENT.

NATURAL READING METHOD. — See READING.

NATURAL SCIENCES. — See BOTANY; CHEMISTRY; GEOLOGY; GEOGRAPHY, etc.; also EXPERIMENTATION; NATURE STUDY; SCIENTIFIC METHOD.

NATURAL SELECTION. — See ACQUIRED CHARACTERISTICS; EUGENICS; EVOLUTION; HABIT; HEREDITY; INSTINCTS.

NATURAL SIGN. — A gesture or other form of expression which calls up an elaborate idea through a reproduction of some portion of the personal reaction that would be natural in the presence of the object which it is wished to call to mind. C. H. J.

See LANGUAGE.

NATURALISM. — See HUMANISM AND NATURALISM.

NATURE. — Probably no philosophical conception has had a more general or widespread popular influence than that of nature. Its intellectual career has been facilitated rather than hindered by the variety and ambiguity of senses attached to the term, especially as regards the things to which it has been set in opposition. Recognition of the rôle of this uncertainty in enhancing the influence of the idea is not necessarily cynical or skeptical in character. The more typical senses of the term are sufficiently near to one another so that they insensibly pass into each other; while all of the more fundamental ideas operative in human history have some vagueness attaching to them, because they stand for deep-lying practical aspirations and for intense emotional attitudes as well as for rational notions which may be accurately defined. The function common to the differing senses of the term nature has been the demand for some standard or norm for the regulation and valuation of human beliefs. It designates whatever is taken to be intrinsic and inevitable in existence and thought, in antithesis to what is external, artificial, and factitious; leaving it to the culture of the time to determine just where the natural, the normal and normative shall be looked for, and just what, in contrast, shall be regarded as secondary and accidental.

The classic conception of nature, as fixed by Aristotle, was an aftergrowth (and to some extent an outgrowth) of the inquiry raised by some of the sophists as to whether religion, morality, and the State exist by nature, or by mutual agreement (convention, tacit or express) or by decree, by enactment of superior authority. This led to an inquiry after the true nature of things, their real essence. Etymologically, φύσις, the Greek word translated "nature," was derived from the verb "to grow," just as the Latin *natura* is from the verb "to be born." Aristotle identified the nature of a thing with the thing in its full or completed growth, which is also the thing in its state of fullest activity or actuality. The nature of an acorn is the oak; the true nature of the human body is the intellectual activity in which the organic processes are most fully realized; the nature of the individual is the state in which alone distinctively human properties (in contrast with those of brutes and gods) come to realization. The distinguishing trait of nature is that the process of realization, involving the four ultimate principles or causes (*q.v.*), takes place from within, in contrast to art (all products of human invention and skill), where the movement is initiated from without. This metaphysical and teleological conception of nature was taken up into patristic and scholastic philosophy. The Stoics retained much of the Aristotelian idea, but conjoined it with the popular sense of nature as the sum total of laws, processes, and events that constitute the world as an organized whole or cosmos, — hence the precept of life in accordance with nature as the supreme moral precept. Through the influence of the Stoics upon jurisprudence, the conceptions of a "state of nature," "natural law," and "natural right" were introduced as affording the norm of eternal justice in distinction from the positive institutions and civil laws which represent the adaptation of this eternal law to temporary and local conditions.

In modern times the conception of nature was first affected by the rise of physical science. It meant the sum total of laws which "govern" natural phenomena. Sir Isaac Newton considered these laws to present the divine legislation for the realm of created things, expressions of a rational will, so that nature might almost be conceived as a divine vice-regent. This meaning was taken up by the Deists and made the basis of a criticism of the miraculous and the supernatural in religion. As the influence of this mode of thinking spread into France, the conception of nature was generalized and made an implement of criticism of everything in the Church and State that appeared to the *philosophes* to be irrational. Since these social institutions were historical products, it is hardly too much to say that the term nature as a eulogistic term was put into opposition to history, and to everything whose existence depended upon historical traditions rather than upon an enlightened reason.

Rousseau agreed with the rationalists in opposition to existing social institutions as artificial and so unnatural, but attacked the philosophers of the enlightenment by including art and science as themselves artificial, sophisticated, and misleading. Nature, according to him, was not to be looked for in conscious reason, but rather in primitive, instinctive, unreasoned impulses and emotions. The natural is the original in the sense both of the primary in time and the creative, the originative. The "return to nature," that concept so influential in educational philosophies if not in school practice, was a return to the primitive untaught sources that condition all teaching. While there was much in Rousseau which would lead his followers to interpret the natural as an idealization of the life of savages into a poetic idyl, there was also much to call attention to the original instincts and principles of growth in children. Through the influence of Rousseau upon Pestalozzi, Froebel, and others, education in accordance with nature came to mean that there were certain intrinsic laws of development or unfolding, physical, mental, and moral, in children, and that these inherent principles of growth should furnish the norms of all educational procedure.

Meantime, the attacks by Rousseau upon civilization in the name of nature called out not merely the interest of Romanticism in picturesque natural beauty untouched by human hands, in folklore, primitive arts and poetry and in peasant life (as more primitive, unsophisticated and unconsciously creative), but also that phase of German philosophy which deliberately set itself to justify culture as being more truly natural than crude nature and than original impulse and instinct. This tendency found expression in all of Goethe's later work, as well as in the philosophers, Kant, Fichte, and Hegel, and in Schiller's conception of art as the great civilizing and moralizing agency of humanity. The same movement led to the idea that the nature of man is found in humanity, rather than in the individual; and hence to an idealization of history, since it is in history rather than in the consciously evolved ideas of an individual that humanity is revealed. This movement culminated in Hegel's theory that social and political institutions in their historic manifestation are more truly real than either phenomena of the physical world or the moral efforts of individuals in their individual capacity — that indeed the entire education of the individual consists in effecting in him an assimilation of the spiritual products of humanity in its historic evolution as a progressive realization of spirit. In this way, the criticism of Rousseau's return to nature reached its climax in a wholly antithetical theory. J. D.

See CULTURE; HUMANISM AND NATURALISM; ROUSSEAU.

NATURE STUDY. — A term which within two decades has come into prominent use in America and England to designate certain studies of natural things, particularly in schools of elementary grade. Also, in a much more limited usage, nature study means popular study of animal or plant natural history outside of schools by children or adults. The term has been applied chiefly to elementary studies of living things; but within recent years many lessons dealing with inorganic nature have been introduced into the nature study of elementary schools. As a matter of convenience, some writers distinguish between biological nature study for living things and inorganic or physical nature study including lifeless objects and the processes of heat, light, etc.

The term nature study was for many years criticized, because etymologically it suggests all scientific studies of nature, and hence is coextensive with the combined natural sciences; but this objection is no longer urged by prominent scientists, for it is now generally understood in both England and America that nature study means a special type of study adapted primarily to pupils of elementary school age.

The fact that nature study and natural science deal with the same objects and processes has led to much investigation and discussion of possible differentiation in educational practice. It is now agreed among the leaders of the nature-study movement that a satisfactory division of the field between nature study for elementary schools and science courses for higher schools has been found in theory and is rapidly becoming successful in practice. Briefly, this differentiation is along the following lines: Science, in the strict sense, is concerned with knowledge organized under principles or generalizations, *e.g.* evolution, cell doctrine, and other principles of biology, atomic theory of chemistry, and conservation theories of physics. The best science courses in high schools and colleges are now presented so as to set forth the fundamental principles, and the natural materials are studied chiefly as illustrations of principles. In short, the present-day courses in science revolve around the principles which lie at the very heart of organized knowledge.

Now, most of the great principles emphasized in courses of science in high schools and colleges are admittedly beyond the mental grasp of elementary school children. This is one suggestion looking towards differentiation, and it has proved the most useful. Nature study, independent of the generalizations which characterize science in the strict sense, has come to deal with nature as it touches our daily lives directly. Here, then, are the essential differences between nature study for elementary schools and science for higher schools: (1) the material for study may be the same; (2) the observational method of study differs only in degree of advancement; (3) but the point of view is radically different, for science aims primarily at scientific principles, while nature study avoids these and deals with natural things and processes as they directly concern daily life. Of course, science study of the "applied" type does not eliminate every-day human interest, but this is reached somewhat indirectly in that the first aim is for principles, and, secondarily, these are applied to practical life. It is most useful in practice, however, to recognize that nature study for elementary schools and science for higher schools differ chiefly in that nature-study lessons are not organized with direct reference to the characteristic principles of science.

Nature study, however, should not be unorganized and without continuity of lessons, that is, mere object lessons of the old type. It may be independent of the organization of science and still have an efficient organization for educational ends. For example, a study of useful trees and elements of forestry may be educationally organized for pupils who are too immature to comprehend the principles of botany.

It should be noted that there can be no sharply defined line between nature study and science so far as practice in our school system in its entirety is concerned. In the upper elementary grades and first year of the high school the best nature study gradually leads the way into more and more advanced lessons which are designed to point directly to the great generalizations of science. But the line can be drawn sharply enough for all practical purposes, and there is no longer any sufficient excuse for duplicating in nature study the work already well done as science in high schools.

The distinction between nature study and science may be summarized in the following definitions: "Nature study is primarily the simple observational study of common natural objects and processes for the sake of personal acquaintance with the things which appeal to human interest directly and independently of relations to organized science. Natural science study is the close analytical and synthetical study of natural objects and processes primarily for the sake of obtaining knowledge of the general principles which constitute the foundations of modern science."

As to the educational values of nature study, it is now commonly recognized that they relate to discipline and information; discipline in habits of thoughtful observing, and information which has æsthetic, moral, practical, and intellectual influence in the every-day life of the average individual. To develop these values the teaching should be directed by certain definite aims; and summarizing the predominating tendencies of the present time, the great aims are in essentials as follows: (*a*) To give pupils general acquaintance with and interest in common objects and processes in nature. (*b*) To give the first training in accurate observing as a means of gaining knowledge direct from nature, and also in the simplest comparing, classifying, and judging values of facts: in other words, to give the first training in the simplest processes of the scientific method. (*c*) To give pupils useful knowledge concerning natural objects and processes as they directly affect human life and interests.

There is quite general agreement that there is one fundamental method of teaching nature study that consists in getting the pupil to see and think for himself, and this is observation in the scientific sense. Upon this depend two of the three aims above stated, the aim for sympathetic acquaintance and the aim for training in methods of observing. Books and lectures cannot suffice for these, as possibly they might for giving useful information. There is now little dissent from the proposition that true nature study cannot be primarily book study. Rather should nature study aim to make the pupil learn to study nature in the absence of books, thus preparing for the usual condition in our every-day life. But although emphasizing observation as the essential basis of nature study, it is coming to be accepted widely that books for supplementary study are desirable. This refers to elementary scientific books, and not to the so-called nature stories, fables, and poems, which may well be read and explained as part of correlated language lessons, but not as nature study.

With regard to the selection of materials for study, there is universal agreement that we should, first of all, select the most common and the most interesting from the viewpoint of every-day life. The application of this principle is responsible for much of the apparent lack of uniformity in courses of nature study. The geographical distribution of natural things, particularly the living, is highly variable, and hence the selection of common things for nature study must vary.

Much study is now being devoted to the problem of organizing nature-study courses. The pioneer work was largely stimulated by enthusiastic scientists, some of whom went so far as to advocate entire freedom from organization; but gradually the subject is now coming under the influence of specialists in education who are applying the general principles accepted for all other phases of elementary education.

At present many science teachers are much interested in the problem of adding to nature study many studies of inorganic nature in correlation with the biological work, which has long been so prominent that many educators have regarded nature study as an elementary phase of biology. There is a widespread tendency in America towards making grammar school nature study largely inorganic. So far most of this has been called "elementary science," and is largely an extract from college physics and chemistry; but much dissatisfaction points towards reorganization from the standpoint of nature study. In addition to such inorganic nature study in one or two grammar grades, there is need of some simple problems on the same line in even the first primary grades.

School gardens have proved a very important phase of nature study, especially because they combine in such a natural way the animal, plant, and inorganic aspects of nature. Most school gardens which have well-developed educational aims are conducted in harmony with the established principles of nature study. (See GARDENS, SCHOOL.)

Perhaps the most important of the present problems of nature study in America is that of connecting physiology and hygiene with nature study. There is a widespread opinion that hygiene should be taught on the observational basis of nature study. The following will suggest some of the possible correlations between nature study and hygiene; but the details of the plan will necessarily depend upon the course in nature study. In nature study work with squirrels, rabbits, or other common animals, the form and uses of mouth, jaws, and teeth may be made to lead to comparison with human teeth, their use and their care. Thus all the elementary hygiene of the mouth cavity may be correlated with nature studies of animals. Likewise, the hygiene of human skin, hair, and nails may be connected with studies of these structures in various animals. The hygiene of clothing is naturally referred to in connection with nature-study lessons on the fur or wool of animals, possibly with silk and cotton, and also with lessons on heat in the inorganic nature study. The useful hygiene of the eyes and ears may be introduced in connection with simple experiments with light and sound. The question of food, which is so prominent in elementary books of hygiene, may be associated with lessons in domestic science, and also with nature-study lessons on animals and plants which are used for human food. These are simply suggestions of possible correlations which would involve the most valuable hygienic teaching in the elementary schools. Such correlations would undoubtedly make the hygiene vastly more interesting to pupils, and at the same time avoid a separate time assignment. It is doubtful whether there is any hygiene useful for pupils in any of the first six or seven grades of the elementary school which it is not possible to bring into close relation with biological and physical nature study.

Concerning the relation of nature study to geography, it is obvious that the two subjects touch in the home, industrial and physical aspects of geography. The nature study of the earliest grades should include topics which will pave the way for home geography. The first formal work in geography usually relates to the home environment, and, in so far as the observational method is used, such home geography is good nature study. Moreover, the nature study of the same year should center around topics especially related to homes, such as ornamental plants, building materials, simple sanitation, and local food-supply.

Many of the topics in the industrial aspects of geography suggest correlations with nature study. For example, fisheries, lumbering, agriculture, and mining, in industrial geography, suggest nature study of certain aquatic animals, lumber-producing trees, elementary gardening, and elementary mineral studies. Finally, the physical aspects of geography demand correlation with inorganic nature study. For example, weather studies on an observational basis are good nature study; and experiments with air, water, light, heat, and electricity are needed in correlation with physical geography. The geography of foreign countries offers no useful opportunities for correlation with nature study, which deals primarily with the home environment. Lions, tigers, plants producing tea and coffee, and other foreign materials had better be observed as illustrative of geography lessons.

The recent movement in America towards industrial education has resulted in much agricultural instruction in rural schools of elementary grade. In some places it has been called " agricultural nature study "; in others, " elementary agriculture "; and in still others " nature-study agriculture." Elementary agriculture tends to be a weak imitation of the vocational aspect of high school agriculture; while agricultural nature study or nature-study agriculture is practically nature study including many natural things connected with agriculture. The nature-study point of view is most desirable in the elementary agricultural teaching. It is commonly admitted that in the first six grades agricultural nature study should deal with the common things of country life, but from the viewpoint of general nature study which is not limited to the utilitarian aspects of agriculture. With regard to the grammar grades of rural schools, there is a strong movement towards including the elements of agricultural science. This is open to criticism because its vocational value for young pupils is doubtful, it presents only the commercial side of country life, it displaces hygienic and chemico-physical studies of great value to all grammar school pupils, and as general education is inferior to advanced lessons from the general field of nature study.

In America, nature study in the widest sense is fostered by the American Nature Study Society, founded in 1908 and with about one thousand members, including all educators who are prominently identified with the movement. The *Nature Study Review*, founded in 1905 and " devoted to all scientific studies of nature in elementary schools," is the official journal. In England the School Nature-Study Union, organized in 1903, publishes *School Nature-Study*. M. A. B.

See AGRICULTURAL EDUCATION; GARDENS, SCHOOL; CHEMISTRY; GEOGRAPHY; HYGIENE; OBJECT TEACHING; PHYSICS.

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See also References under GARDENS, SCHOOL.

NAUTICAL SCHOOLS AND ACADEMIES. — See NAVAL EDUCATION; SEAMANSHIP, TRAINING FOR.

NAVAL EDUCATION. — That form of education which fits officers and men for service in the navy. While it embraces also nautical education, the latter relates mainly to peaceful pursuits on the sea. The principal commercial lines arrange for the training of their young officers in the vessels of the regular service, or in some cases in school ships; and there exist in some of the states, as a part of the local school system, school ships in which young men are trained for the merchant marine. The technical schools and colleges also provide courses in such subjects as nautical astronomy and navigation, and in all branches of marine engineering. In this article only that form of naval education which equips officers and enlisted men in the navies of the chief countries will be dealt with.

United States. — *Enlisted Men.* — The main body of the naval force consists of the enlisted men. In early days their education was simple. A merchant sailor was quickly at home in a man-of-war. The sails and rigging were generally similar to those in a merchantman; and the ordnance of the day did not present any difficulties that could not be mastered after a brief apprenticeship. In a modern man-of-war, however, while the engines and boilers may resemble those of a liner, the ordnance and other mechanisms are complicated in the extreme and need the services of a highly trained personnel. With progress in machinery and gunnery it was seen that the enlisted men would need to be trained in their specialties. The enlistment of boys as naval apprentices was undertaken before the Civil War, but the early attempts to establish a training system did not prove successful. A reason frequently assigned for early failures was that although the hope was held out to the boys that they might win a commission, only few did so, and the rest were disheartened. A way should always be open for subordinates to rise, but this should not be held out as the main inducement in the training of seamen.

The present system dates from 1875 afloat and 1881 on shore. The early idea was to embark the boys in cruising training ships and there give them the rudiments of a man-of-war's man's education. Later a shore headquarters was established at Newport, where the boys were received, and from which they were transferred to the cruising ships for further training. Then came a parallel system of training for landsmen, with entry at eighteen, the apprentice boys entering as young as fourteen. The landsmen spent only a short time at the training station and were then drafted to general service. The present system is an evolution or development. It combines in a measure the two earlier ones. The recruit is received as early as seventeen and is called an apprentice seaman. He serves about four months at the training station, where he is given preliminary instruction. The cruising training ships have now entirely disappeared from the system, the apprentice seamen going from the training stations directly to general service. Besides Newport, there are now training stations at Norfolk, San Francisco, and North Chicago.

The instruction of the apprentice seamen at the training stations is necessarily elementary. The recruit is put into uniform, taught neatness and cleanliness in person and clothing, learns to sleep in a hammock, to pull an oar, to box the compass, heave the lead, also a certain amount of knotting and splicing, signaling, boat sailing, swimming, the sails and rigging of a ship, gunnery, infantry drill, and last, but not least, discipline. After leaving the training station and joining a cruising ship, the education of the apprentice seaman is entirely practical. He learns his duties in the main by doing them and seeing others doing similar duties, though all the men are under the supervision of, and are instructed in their duties by, their officers. When qualified, he is promoted to higher ratings.

Artificer and Special Branches.—In addition to the seaman branch, there are the artificer branch, which includes the machinists, firemen, electricians, carpenters, and the like; and the special branch, which includes yeomen (writers), the hospital corps, stewards, cooks, bakers, musicians. The specialty classes at one or more of the training stations include yeoman classes (correspondence and accounting), musician classes, schools for hospital apprentices and for cooks, bakers, and commissary stewards. These schools are entirely practical, the methods and appliances being identical with those to be found on board ship.

It is thus seen that opinion has varied in the past as to the advantage of one or other of two systems, the first a special training of some length, in cruising training ships; the second, a short stay at a training station, for organization and rudimentary training, with completion of the training in the ships of the regular service. Whatever the merits of the two systems, the second is largely the method in the civil trades; but the controlling reason in any case is that the first system requires too large a training service, perhaps as many as thirty special ships, which is prohibitive. The navy itself is now the training school.

In addition to the training system as above described, there are several service schools for enlisted men. The seaman gunners' class is made up annually of deserving men in their second enlistment and under thirty years of age. One branch of the class is at the Gun Factory in Washington, where instruction, combined with practical work, is given in ordnance and mechanisms. The other branch is at the Torpedo Station at Newport, where the men are instructed in torpedoes and diving. These courses last six and eight months, respectively, the graduates becoming gunner's mates.

The electrical school is at New York. The course here is about five months, and includes the theory and practice of electricity and electrical mechanisms and of wireless telegraphy. Besides class work and lectures the students engage in practical work in the shops. The appliances are similar in all respects to those to be found on board ship.

The machinists' school is at Charleston, S.C., and is made up of deserving men under thirty years of age who have mechanical knowledge or have shown mechanical ability. There are two classes, according to the knowledge and requirements of the men. The course includes bench work, practice with machine tools, and running and repairing marine engines. It lasts about sixteen months.

Artificers' schools give practical instruction to carpenter's mates or shipwrights, blacksmiths, plumbers, painters, and ship fitters. The subjects include the practical work of these several trades, in which the men have already had some experience and practice. The course lasts for three months.

From the above, the instruction of enlisted men is seen to be on a very satisfactory basis. Recruiting is not difficult, owing to the benefits offered and to the fact that the positions are open to landsmen as well as to men with nautical knowledge. On leaving the service, the ex-sailors are sought after in civil occupations, as they have all acquired knowledge which is as useful in civil life as in the navy. The time spent in the navy is thus a true training in character, resourcefulness, and knowledge, and is of advantage to the country and would be desirable entirely apart from the service rendered by the navy.

Officers. — The education of officers offers problems of a far more serious nature than that of enlisted men. The line of the navy may be taken up at first. Line officers enter as boys, midshipmen, with the intent of making a life career of the navy. In old times they received their appointments at an early age, from twelve to fifteen, and went at once to a cruising ship. Here they picked up readily all manner of practical information about the ship, but had no thorough grounding in general education or in the higher arts of their profession. The instruction they obtained in the service was scant, and, besides that received from the schoolmaster, if there was one on board, was due in the main to the kind-hearted interest perhaps of the chaplain or of the older officers. Their advancement in knowledge depended mainly on themselves, and it is to their everlasting credit that they developed into the characters that make up our early naval history.

The Naval School at Annapolis, was established in 1845 by George Bancroft, the historian, at the time Secretary of the Navy. The object, in his own words, was "to collect the midshipmen who from time to time are on shore, and give them occupation during their stay on land in the study of mathematics, nautical astronomy, theory of morals, international law, gunnery, use of steam; the Spanish and French languages, and other branches essential in the present day to the accomplishments of a naval officer." The title of the school was changed in 1850 to the United States Naval Academy, which it has since retained.

Midshipmen entered the school originally at from 13 to 17 years of age. This was changed later to 14 to 18, then 15 to 20, and is now 16 to 20. These last ages are generally regarded as too old, and the range is too great. It is proposed now to make the entrance ages 15 to 18.

The earlier classes of midshipmen had already been at sea when the school was established, but it was found more satisfactory later to enter them at the school, where they were retained for one or two years, followed by three years at sea, then one or two more years at the school. This plan was not followed for long, and gave way to the system of four continuous years at the academy. The summers were given up alternately to practice cruises and leave of absence. This is still the general plan, though since 1873 the course has been six years, the last two at sea in ships of the regular service, with a final examination at the end of the six years. In 1912 the course was changed back to four years, at the conclusion of which the midshipmen are commissioned in the regular service.

The best method of educating midshipmen has been the subject of much discussion. Had ideas on education in general been more settled, it might have been simpler to establish a satisfactory course at the Naval Academy. Education develops the mind and character and also imparts information. This information may be either generally useful in life, or useful in some walk of life. If the latter, it may be designed to cover the whole field of the vocation, or it may simply fit the student to begin life in that particular field. These considerations all affect the character of the Naval Academy education, and the weight given at various times to one or the other of the acknowledged objects has produced corresponding variations in the subject matter of the course. All admit the necessity of developing mind and character, and there is sufficient unanimity on the subjects to be required in the earlier years of the course to satisfy a general education. There remains the proper division of theoretical and practical subjects included in the naval profession between those covering the whole field and those required to fit the midshipman to begin his life in the navy. To this question is due whatever diversity of practice that has existed in the past. Such will also probably be the case in the future.

The following consideration must be borne in mind. The young officer must be prepared to begin his career aboard ship. To develop into a successful naval officer he must study all the rest of his life. He should learn the rudiments of the whole profession at such time as he has the opportunity to pursue a systematic course, that is, at the Naval Academy. He should learn thoroughly the duties he will have to take up on graduation. The time that can be devoted to the course at the Naval Academy is limited. If criticisms have been made at any time, it is that possibly too great an effort has been made to impart detailed knowledge that would be useful to higher officers, but could not be employed by a midshipman on graduation. And on the other hand, it is only within a few years that the subject of naval strategy has been included in any form in the course of instruction. Midshipmen are not expected to exercise naval strategy, but they are entitled at least to know that there is such a subject, before discovering it for themselves, if their inclinations lead them to the study of the art of war.

Another matter is the correct adjustment of the relative weight of theoretical studies and practical exercises. Many good practical officers in the navy have not been strong in studies. The navy needs both types, practical officers, and also officers capable of independent theoretical research, and it needs more of the former than of the latter. If a sufficient number of practical officers is developed, there will be inevitably among the number enough officers of scientific attainments to supply the needs of the navy. On this principle, a large weight should be assigned to practical exercises designed to develop the greater proportion of naval officers.

A correct utilization of the available time at the Naval Academy would require, therefore, thorough instruction in all the duties of the young officer, and, so far as the remaining time would permit, elementary instruction in every professional subject.

Candidates for the service are admitted to the Academy by nomination and on passing the required mental and physical examinations. Each senator, representative, and delegate in Congress is allowed two (after June 30, 1913, only one) midshipmen at the Academy; and five each year, appointed by the President, are allowed for the United States at large. One midshipman is maintained from Porto Rico by the President. Two entrance examinations are held each year. The mental examination covers punctuation, spelling, English grammar, geography, United States history, world history, arithmetic, algebra through quadratics, and plane geometry. The maximum mark is 4.00; the passing mark 2.50. No candidate is admitted without passing the physical examination before a board of three navy surgeons.

The present course at the Naval Academy includes the following: —

Mathematics, first two years; algebra, geometry, trigonometry, calculus, analytic geometry, spherical trigonometry, stereographic projection.

English, first two years; rhetoric, composition, literature, naval history.

Modern languages, first two years and last half of last year; French and Spanish.

Marine engineering and naval construction, whole course except first half year; mechanical drawing, mechanical processes, principles of mechanism, marine engines and boilers, naval construction, engineering mechanics, experimental engineering, gas engines, turbines.

Physics and chemistry, second year; elementary physics, chemistry, physics.

Seamanship, last two years; boats, ships, naval tactics, naval warfare, international and military law.

Ordnance and gunnery, last two years; infantry, artillery, gun drills, torpedoes, mines, elastic strength of guns, exterior ballistics, range tables, fire control, target practice.

Mechanics, first half of third year; theoretical and applied mechanics.

Electrical engineering, last two years; electricity, magnetism, electromagnetism, electrochemistry, direct and alternating currents, dynamo-electric machines, heat, power, light, wiring, testing, communications, devices and instruments, wireless telegraphy, and telephony.

Navigation, last half of third year and fourth year; astronomy, theory and practice of navigation, compass deviation, surveying.

Naval hygiene, first half of fourth year; effects of alchohol and narcotics, first aid to injured.

In addition to the instruction and recitations in the above subjects, which take place during the regular study hours, there are every afternoon of week days (mornings on Saturdays) drills and exercises in all professional subjects. These exercises include all the subjects that have been enumerated in the training of enlisted men, also the practical work of every sort that is performed by or comes under the supervision of officers in their daily duty aboard ship. This practical work is further supplemented by the summer practice cruise, in which all the midshipmen take part, with the exception of the new entering class, who engage in practical work at the Naval Academy. In 1912, for the first time, the two senior classes are embarked in ships of the regular fleet, the third class going in a practice ship as before.

The Naval Academy course thus gives officers a grounding in all the professional work of the navy. It does not train them to be specialists in the various subjects. This is reserved for further, or postgraduate courses.

Postgraduate Courses. — Officers not above the rank of lieutenant who make a specialty of marine engineering join an engineering class with headquarters at Annapolis. The course includes design of engines, shop practice and management at private establishments, experimental engineering, and mechanical appliances. The chief engineers of the larger ships are usually selected from officers who have taken this course. A further course in electricity is also to be established for officers. The ordnance specialists also have a postgraduate course. A class of young officers is made up annually to go more thoroughly into such matters as gun design, interior and exterior ballistics, the chemistry of explosives, metallurgy, torpedoes, experimental work, shop practice. Officers selected for the Construction Corps, from Naval Academy graduates who have had a short sea experience, go first to the Massachusetts Institute of Technology at Boston for a course in naval architecture and kindred subjects, on completion of which they are commissioned assistant naval constructors. A law course is followed by officers detailed for duty in the office of the Judge Advocate General, unless they have previously taken such a course. Foreign languages are studied by young officers detailed as attachés, assistants to the naval attaché, at the embassies and legations in various foreign countries. Assistant surgeons on first appointment follow a course in the Naval Medical School. This insures uniformity of instruction and enables the young medical officers to learn something of naval practice. Assistant paymasters have a short course of instruction in the Bureau of Supplies and Accounts and in the Treasury Department. Officers selected for the Civil Engineer Corps follow a course at the Rensselaer Polytechnic Institute, Troy, N.Y. The work is kept up later by a correspondence course directed by the Bureau of Yards and Docks. Young marine officers follow a course in military practice and duties at the Marine School of Application at Norfolk, Va.

An examination of these courses will show that all the technical work of the navy resulting in the finished ship and her equipment is performed by graduates of the Naval Academy. All the officers concerned in this work are line officers except the naval constructors. Until 1899 the engineer officers belonged to a separate corps, but at that time they were merged with the line.

A principle that has been gaining strength recently is that all combatant officers should belong to one corps and that all technical work in connection with the finished ship should be performed by specialist officers of this one corps. Line officers at present are responsible for all design and work in connection with machinery, ordnance, electricity, torpedoes, wireless telegraphy. The principle stated would require them to take up construction work also, and it would also involve the merging of the pay corps into the line. The surgeons and chaplains are non-combatants under the conventions of international law and would retain their present status. The principle has given excellent results with reference to ordnance, engineeering, torpedo, and electrical work, and it is logical to carry it to its conclusion. It is of course not intended that each line officer should take up all specialties, but that specialization should occur in the line instead of in separate corps, and that all line officers should take up at least one specialty.

Naval War College. — A school of a different scope from any of the above is the Naval War College at Newport, R.I. This school was established in the early eighties mainly through the efforts of Rear Admiral Stephen B. Luce. Its purpose was to afford an opportunity to officers of mature years to study the art of war. It was the first war college proper for naval officers to be established by any nation. Since that time all the leading nations have established similar colleges. Rear Admiral Mahan was one of the early lecturers. His works, delivered first as lectures, have made him and the college famous, and have in effect crystallized the art of naval warfare. The course comprises lectures on naval history, tactics, strategy, logistics, international law, and includes so-called war games, which are exercises in tactics and strategy. The tactical game is played on a table divided into squares to scale. Small ships of lead arranged in divisions, squadrons, and fleets are maneuvered as in action, one move on either side representing a certain number of minutes at a known speed. The effect of gun fire is estimated according to range and the strength of the ships in offense and defense, and is counted up for each move. Torpedo fire is estimated in a similar manner. Each ship has a life of so many units, and is disabled or destroyed according to the units scored against her. The strategical game is played with the aid of charts. Each side has a separate room or rooms, and the umpire another room. Each move represents a certain interval of time and is communicated to the umpire, who in turn informs the opponent of so much as he would be supposed to see for himself in actual maneuvers.

The course consists of a summer conference of officers of all ranks lasting for four months. There is also a so-called long course, made up of selected officers of the conference, which continues on through the winter and the following summer conference, or sixteen months in all. The permanent staff of the college consists of a president, a director, a secretary, and officers for the different departments. Their usual term is three years.

Information was formerly imparted largely through the common efforts of the conference, with a discussion of all subjects that came up in connection with the assigned problems. This method of work was more congenial to the older officers than would have been instruction in classes, such as is usual in schools. Another reason was that at the start the instructors were not much farther advanced than the students. But the development has now reached a point where it saves time to give regular instruction in methods and principles that have found general acceptance.

The War College is more than a school of instruction in the science of war, that is, in a knowledge of principles; it also imparts something of the art, which may be defined as the aptitude of experience. Naturally there can be no experience of actual war gained at the college, but the tactical and strategical exercises are of such a character that the student must reach a decision and must act on his decision, which is, of course, the essence of experience, in war as in other occupations.

The War College also makes theoretical studies of war plans, not as a part of its work of instruction, but because the lines are parallel. The situations that are brought up for exercise need often only the attaching of names and dates to convert them into plans of campaign. This work is assigned to the War College, not because it is directly connected with the instruction of officers, but because the permanent staff of the college gains familiarity with the conditions involved while in the performance of their regular duties. This work thus becomes of mutual benefit to the college and to the division of operations of the Navy Department.

The War College is thus the culmination of education in the navy. Seamen apprentices and midshipmen have to be trained to give them a start in their career. Enlisted men and officers have to pursue further courses in special technical matters; but the art of war itself, without a knowledge of which all the rest would be energy misapplied, is reserved for the mature deliberations of the War College, which is therefore one of the most important institutions of the navy.

England. — *Enlisted Men.* — The Royal Navy is recruited from boys (sixteen or seventeen), youths (seventeen or eighteen), men (eighteen to twenty-three), all of whom bind themselves for twelve years, in the fleet or in the reserves. The boys and youths who are not found suitable are discharged, whereas the men (eighteen to twenty-three) serve only a part of the time in the fleet, with exceptions, then go to the reserves. The men of long service who reëngage become entitled to a pension in time, whereas the men discharged early or transferred to the reserves are not so pensioned. The pensions, therefore, are accepted as the cost of good men, while the government saves on those who are discharged early. The reserve men are paid an annual retainer and continue to reëngage up to the age of forty-five to fifty.

Boys on entry are given an elementary course of several months in gunnery, seamanship, and mechanical work. There are several training stations, the principal one being at Shotley, in Suffolk. After leaving the station they go to sea in a cruiser and keep up their work in the same subjects, to which is added a course of stokehold training. This work may occupy a year in all, when the boy is drafted to a seagoing ship. At the age of eighteen he becomes an ordinary seaman. Thereafter he continues his training in the above subjects, with torpedoes and field training added, and he must qualify in all of them before becoming an able seaman. The training of the youths (seventeen or eighteen) is similar to that of the boys, except that the time is shorter. The subsequent career is the same in either case.

Special Schools. — There are special gunnery and torpedo schools for enlisted men at the principal home ports. Of these, Whale Island at Portsmouth is the typical gunnery school, and the *Vernon*, likewise at Portsmouth, the typical torpedo school. The men are trained for the respective rates of seaman gunner and seaman torpedo man. The course is largely practical, designed to give the men a complete working knowledge of the weapons and their mechanisms, ammunition, the methods of target practice, and kindred subjects. A qualifying examination is required before passing. Signal schools for officers and men exist at the principal home ports, where is taught all manner of signaling, including wireless telegraphy.

Physical training has taken a prominent part in the British service of late years. In the days of masts and sails no further training was required other than that necessary in the handling of the ship. Sailing training ships were retained probably longer than their usefulness warranted, almost entirely from the advantages they offered in this direction. "No amount of dexterity on the main royal yard would make a seaman a good gunner or torpedo man, although the physical exercise which the old sailing ships offered was undoubtedly beneficial; but as physical exercise can be introduced in other more useful ways, and in a more scientific manner, it was needless to adhere to it in this form." (From *Parliamentary Return, Admiralty Policy*, 1905, p. 19.) This quotation is an apt summing up of the whole situation as regards sailing training ships, a question that has vexed the navies of other nations as well.

The present physical training is largely on the Swedish system. The gymnastic instructors of the fleet are required to go through a special course at a school on shore — the principal one is at Portsmouth — and the naval regulations require sufficient time to be devoted to the exercises in every ship of the fleet.

The engine-room personnel also have their training schools, one at Devonport, for stokers, who after a two years' course become mechanicians, and may eventually become warrant officers. Another school is that for boy-artificers, with branches at different dockyards. They enter at fifteen or sixteen and are four years or more under training. In the first half of the course the subjects are: practical mathematics, English, elementary science, heat. In the second half they are: applied mechanics, workshop appliances, electricity, marine engines and boilers, mechanical drawing. On completion of the course these boys become engine-room artificers, and may eventually become warrant officers.

Officers. — The method of entry of midshipmen in the early days is known to every reader of Marryat's novels. The first regular school was the Naval Academy at Portsmouth, which was established about 1730, and educated a limited number of midshipmen, the rest entering the service directly. The age of entry was eleven to fifteen and the length of the course was about three years, after which the pupils went to sea as midshipmen. In 1806 the institution was enlarged and the title changed to Naval College. The number of students was about 100, which still did not include all entries. The course was two to three years. A few lieutenants on half-pay were also in attendance. The college continued as such until 1837, when it was discontinued. Thereafter for twenty years all midshipmen entered the service directly, as in the old days.

The next school for midshipmen, or naval cadets, as they were now called, was established aboard the *Illustrious* at Portsmouth in 1857, and was transferred to the *Britannia* in 1859. Captain Robert Harris was the first head. Under the new plan all candidates for midshipman passed through the *Britannia*, entering between twelve and fourteen and remaining a year. The ages have since been increased and the course has been lengthened to two years. The *Britannia* was moved to Portland in 1862 and to Dartmouth in 1863, where it has since remained. The *Britannia* provided only for the entry of executive officers, what Americans call line officers. The other branches, that is, engineers, surgeons, chaplains, paymasters, marines, entered under separate rules and at various ages.

In 1903 there was put in effect a system for the common entry and training of executives, engineers, and marines. By the new regulations the old system of nominations and competitive entrance examinations was replaced by an interview before an interview committee and a qualifying examination, thus doing away to some extent with the old "crammer." Cadets now enter between twelve and thirteen, spend two years at the Naval College at Osborne, then two years at the Naval College at Dartmouth, and six months in a cruiser, after which they become midshipmen. The midshipmen keep up their studies for three years longer in the regular service and then become sublieutenants. About two years are spent in this rank, after which the officer is promoted to lieutenant.

The instruction of the naval cadets during their course on shore and on board ship includes mathematics, geometrical drawing, physics and chemistry, mechanics, applied mechanics, applied electricity, engineering, mechanical drawing, seamanship, gunnery, navigation, French, German, English grammar and composition, English literature, history, naval history, geography, Bible study, drills, physical training. The course in all the technical branches is both theoretical and practical, with laboratory and shop work, and practice in steam and motor craft.

The midshipmen at sea devote their time to purely professional and practical subjects, in which they are instructed by the ship's officers. The subjects include: officers' duties, seamanship, gunnery, torpedoes, navigation, pilotage, engineering, about one third of the whole time being given to the last-named subject. The sublieutenants continue the same general subjects, certain of them being selected for a further six months' course at the Royal Naval College at Greenwich (mentioned later), and all perform a stipulated sea service.

On reaching the rank of lieutenant, at twenty-two or twenty-three, officers continue executive (line) duties or, after a total of one year of watch duty at sea, take up one or another specialty, all of which require additional courses, varying in length according to the subject. The symbols (G), (T), (N), (E), (M) before an officer's name indicate that he has qualified as a specialist in gunnery, torpedoes, navigation, engineering, and military duties, respectively. It is the intention that this specialization shall not be permanent, with possible exceptions, but that officers shall keep up their knowledge of line duties and eventually return to the line.

The Royal Naval College at Greenwich is an advanced post-graduate school where officers of the lower ranks are sent to complete certain required courses, and where officers of all ranks may pursue particular lines of study. Assistant naval constructors here receive their education, which extends over a number of years and is specially thorough. The courses at the college in general are professional, technical, and mathematical, and mainly theoretical.

The Royal Naval War College at Portsmouth was established about 1905. The course is for flag officers, captains, and commanders. It consists of playing the tactical and strategical war games, the solution of problems arising out of the strategical conditions of the present day, lectures on naval history, naval architecture, steam, international law, the law of evidence, wireless telegraphy, coast defense. Army and marine officers may attend these courses.

The most noticeable conclusion on studying American and English naval education is the growing opinion in both countries that the education of all combatant officers should be in common, that they should all belong to one corps, and that specialization should take place as necessary in the corps, instead of in separate corps. The Americans took the lead in this direction and have gone further at present than the English, but there are many evidences that the same practice will eventually be reached in both countries.

France. — *Enlisted Men.* — The European countries in general have the conscription system, which simplifies all matters of entry and education. The greater part of the French bluejackets come from the maritime inscription, the rest voluntarily from the general conscription. The men from the maritime inscription may enter as young as eighteen. They are sailors by trade and do not need the same training as the conscripts. The latter come in as young as twenty. The special ratings are practically the same as in other services, and all have their special schools, located in the principal naval ports, where the courses average six months. These are naturally preliminary courses only for the lower ratings. Instruction for the higher ratings goes on continually in active service.

Officers. — The French Naval Academy is at Brest. It used to be on board the *Borda*, which was to the French midshipman what the *Britannia* was to his English confrère. Appointments are usually by competitive examination of boys sixteen to nineteen years of age. The course at the school is two years, when the scholar becomes a midshipman second class and goes aboard a school ship for a year, after which he becomes a midshipman first class and joins the regular service.

The subjects taught include the French, English, and German languages, naval history, geography, mathematics, mechanics, physics, electricity, astronomy, navigation, naval architecture, steam machinery, seamanship, ordnance, infantry and artillery, torpedoes. The time devoted to ordnance and engineering has lately been increased.

Besides the Naval Academy, there are specialist schools at the naval ports for ordnance officers, torpedo officers, infantry instruction, besides service with the board on ordnance. The courses are of various length, after which the officer takes a qualifying examination.

The Superior School of the Navy is at Paris, and is open to lieutenants. The courses are on professional subjects, including tactics and strategy, though the school has little in common with the American and English war colleges. The graduates are placed on a special list, one of the objects being to furnish officers for the staffs of flag officers.

The French have been through the same discussions as other nations as to the unsatisfactory results of having permanently separate corps of officers aboard ship and at the dockyards. The idea of the common entry and training of officers is making headway, but the stumbling block at present seems to be the absorption of the engineers, about two thirds of whom come from below decks, that is, the ranks. There will not be the same difficulty with the other branches.

Germany. — *Enlisted Men.* — Conscription is here in full effect, and, theoretically, whatever training is the best is the one to be adopted. Many boys volunteer for the navy before the age of military service. The intention is to train these boys for the seamen, petty officers, and warrant officers of the fleet. The age of entry is fifteen to eighteen, and they bind themselves to serve to the age of twenty-eight. They are assembled on shore and receive some preliminary instruction, but the greater part of their work is in the practice ships, which are used also for training cadets. After about two years the boys are rated seamen. Training now begins in the various specialties, or, for the men with no specialties, with service in the fleet. Conscripts begin their training with infantry drill and later are sent to general service. All conscripts with seafaring knowledge are required to perform their service in the navy.

Gunnery, torpedoes, engineering, and other specialties are taught in separate schools in which the instruction is very thorough. The petty and warrant officers come principally from the men who enter as boys.

Officers. — Cadets enter before the age of eighteen, receive a short military training on shore, and then go to sea for a year in one of the practice ships (used also, as has been seen, for the apprentices). This cruise is followed by a year at the Naval School, formerly at Kiel, now at Flensburg-Mürwick. Then follow courses in ordnance, torpedoes, and military duties, after which comes a final year in the fleet, making four years in all. The principal postgraduate courses for officers are in torpedoes and gunnery. An examination of the various courses for cadets and line officers would indicate that the Germans do not attach as much importance to theoretical subjects as some other nations, but they encourage initiative and insist that officers shall be practical and shall be able to handle the ships and the mechanisms. The courses for warrant officers are thorough and practical, producing men in these grades who by training and experience are noticeably competent.

The seagoing engineers are of a separate corps, with suitable training, as are the surgeons and paymasters. There are also a nonseagoing machinery construction corps and a naval construction corps. Both of these are civil corps. The subject of common entry and training for all combatant branches has been discussed in Germany, but has not made much headway.

Other Countries. — The principles of education that appear in the navies of the United States, England, France, and Germany are found also in one form or another in all navies. A cosmopolitan influence is always at work in these organizations, owing to their foreign cruises and the knowledge they thus obtain of each other. The effect is noticeable in many ways, from their uniforms, which are all much alike, to their education and training, which are always tending in the same direction, though some nations lead and others follow. R. C. S.

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NAVIGATION, TRAINING IN. — See Seamanship, Training in.

NEAL, EDWARD DUFFIELD (1823–1893). — Educational writer; was graduated at Amherst College in 1842, and later studied theology at the seminary at Andover. He engaged in the ministry of the Presbyterian Church, and was active in the organization of the first public school at St. Paul. He was the first territorial superintendent of public instruction of Minnesota (1851–1858), and he was chancellor of the University of Minnesota from 1858 to 1861. He was one of the secretaries of President Lincoln during the Civil War, and from 1873 to 1884 he was president of Macalister College at St. Paul, which he had helped to found. He was the author of a number of historical works and several monographs on the history of American education.

W. S. M.

NEANDER (NEUMANN), MICHAEL (1525–1595). — One of the most famous teachers in Germany, regarded as second to Melanchthon (*q.v.*). He was born at Sorau and studied at Wittenberg, taking lectures with Luther and Melanchthon. In 1545 he became assistant, then corrector, at Nordhausen, and in 1550 went to the cloister school at Ilfeld, where he became rector in 1559 and was active for forty-five years. Neander is a typical representative of the best educational ideals of the Renaissance-Reformation period. His first task at his school was to produce order out of chaos, and he then applied himself to reforming the curriculum. Dissatisfied with the prevailing curriculum, which devoted most of the pupils' time to a dry study of grammar and left them ignorant in the end, he set before himself the task of inculcating a feeling of reverence for God and a knowledge of letters, languages, arts, physics, history, geography, ethics, and the principles of medicine. He claimed that he could teach in half a year more than other schools taught in two years. His grammars and textbooks covered all the subjects which he attempted to teach. He published thirty-nine books during his lifetime and left fourteen others in manuscript. His educational aims and practice are formulated in a pamphlet, published in 1590: *Bedenken an einen Guten Herren und Freund. Wie ein Knabe zu leiten und zu unterweisen, dass er ohne grosses Jagen, Treiben, und Eilen mit Lust und Liebe vom 6. Jahr seines Alters bis auf das 18. wohl und fertig lernen möge Pietatem, Linguam Latinam, Graecam, Hebraeam, Artes und endlich Philosophiam* (*Thoughts to a Gentleman and Friend. How to direct and instruct a Boy so that he may without much Hurrying, Pressure, and Haste learn well and readily with Pleasure and Love, from his sixth year to his eighteenth, Latin, Greek, Hebrew, the Arts, and finally Philosophy*).

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NEARSIGHTEDNESS. — See Eye.

NEBRASKA, STATE OF. — Originally organized as a territory by the Kansas-Nebraska Act of 1854, and admitted as the thirty-seventh state in 1867. It is located in the western half of the North-Central division, and has a land area of 76,808 square miles. In size it is one fourth larger than the six New England states, and nearly as large as England, Scotland, and Wales combined. For administrative purposes the state is divided into ninety-two counties, and these in turn into over seven thousand school districts. In 1910 Nebraska had a total population of 1,192,214, and a density of population of 15.5 per square mile.

Educational History. — The first school law was enacted and the first school opened in 1855. The State Librarian was made *ex officio* State Superintendent of Public Instruction, and each county was directed to elect a county superintendent, who was to establish school districts, examine teachers, and look after the interests of the schools. A district school tax, the rate bill, and a county school tax of three mills were provided for. Few schools were organized under this law. Three colleges were chartered by the first legislature, only one of which was ever organized. The report of the *ex officio* State Superintendent to the legislature in 1857 showed that there were four county superintendents, seventeen school districts, and six schools in operation in the state. In 1858 a new school law, based on that of Iowa, and with the township instead of the school district as the unit, was adopted in place of the law of 1855. The county superintendency was abolished, and a territorial school commission was created. The law was cumbersome, unsuited to the needs of the time, and education made but little progress under it. By 1860 but twenty-nine schools were reported to be in operation. In 1861 the office of the Territorial Commission was in turn abolished, and the Territorial Auditor was made *ex officio* School Commissioner. In 1866 a school was organized at Peru, which in 1867 was deeded to the state for a state normal school.

The new constitution of 1867, adopted on the admission of the state, contained but little mention of education. The legislature was directed to provide for " an efficient system of common schools throughout the state," and the use of public school funds for secondary schools, or the sale of school or university lands for less than $5 per acre, was forbidden. The first legislature of the new state, acting partly in response to the demands of the first state convention of educators, adopted a new school law, which went into force in 1869. The district system of school administration was reëstablished, and this has remained to the present time. The office of the State Superintendent of Public Instruction was created, and county superintendents were provided for. The State Superintendent was directed to examine teachers, recommend textbooks, and apportion the school funds to the counties on the school census basis. Within the counties the present form of distribution was provided for. Township high schools were permitted in 1858, but few, if any, were organized. From 1867 to 1873 a few high schools were organized by special legislative acts, and in 1873 the first general high school law was enacted. The University of Nebraska was chartered and began instruction in 1869.

In 1875 a new constitution, which is still in force, was adopted by the people. This made much more detailed provision for education than had the earlier one of 1867. Except for a few minor amendments, these provisions have since remained. A State Board of Commissioners for the control of the school lands and school funds was created; a minimum sale price of $7 per acre was fixed for all educational lands; the school funds were defined, the sources for increase were enumerated, the use of the income specified, and all educational funds were declared to be trust funds, to remain forever inviolate and undiminished; the legislature was directed to provide for the free instruction of all persons five to twenty-one years of age; reformatory and parental schools were permitted; and the government of the University of Nebraska was provided for. No important changes in the school laws followed, and almost no legislation of importance took place during the next fifteen years.

Beginning in 1891, a series of important acts were adopted, which have materially improved the educational conditions of the state. In 1891 the free textbook law was passed. In 1893 a new law provided for the permissive attendance of pupils at some other school than that of their district, under certain conditions, and this was extended in 1895 to include transportation across county lines. In 1895 the first of a series of laws was enacted having for its purpose the provision of free high school education to all children in the state, and this was followed in 1899, and again in 1901, by other laws of similar intent, though all three were declared unconstitutional by the courts. Finally, in 1907, a law was enacted which has stood. In 1897 a transportation law was enacted, and the certification of graduates of the University of Nebraska on credentials was provided for. In 1889 a compulsory education law and a child labor law were enacted, under the provisions of which education was made compulsory and labor of certain kinds was forbidden for children between the ages of seven and fourteen years. These laws were amended in 1907 to increase the age in all cities to sixteen years. In 1901 attendance at teachers' institutes was made compulsory; elementary agriculture was made a required subject in the teachers' examinations for a first-grade county certificate; the number of third-grade county teachers' certificates allowed to any one person was reduced from three to two; and a union rural high school law was enacted. In 1903 an additional state normal school was provided for; Junior Normal Schools were created; and the giving or sale of cigars, cigarettes, or cigarette paper to any one under eighteen years of age was forbidden. In 1905 the certification law was revised, and a partial state system of examination and certification was provided for. Questions were to be prepared and all answer papers graded by the state office, and all teachers in high schools were required, after 1907, to be graduates of a university, college, or advanced course of a Nebraska normal school, or to hold a professional state certificate. In 1907 a number of important laws were enacted. A free high school law was passed for the fourth time; county high schools were provided for; normal training in the high schools of the state was authorized, $50,000 of state aid appropriated for such, and a state examination and approval of all such schools required; $50,000 was appropriated from the state treasury to enable all school districts in the state to provide a seven months school (raised in 1909 to $75,000 and the minimum term reduced to five months); the state school tax, previously levied, was repealed; the number of Junior Normal Schools was increased from five to eight, and the summer term of such reduced from ten weeks to six or eight weeks; school district libraries were created; and the compulsory education law was extended from fourteen to sixteen years for the cities of the state. A number of minor changes and revisions in the laws were made in 1909 and 1911. In 1911 the minimum salaries of county superintendents were fixed and very materially increased; new standards for city certification were created; and a state fire day, to give instruction and drill in combating fires, was provided for.

Present School System. — At the head of the present state school of Nebraska is a State Superintendent of Public Instruction, elected by the people for four-year terms, and receiving a salary of $1800 a year. His duties are to visit the schools; to decide all disputed points in the school law, his decisions being binding until overruled by the courts; to prescribe forms for all blanks and reports; to publish the school laws; to outline a state course of study for the schools; to prepare all questions for the examination of teachers, and to oversee the grading of all examination papers; to make rules and regulations for the guidance of county superintendents; to apportion the state school funds; to organize teachers' normal institutes (Junior Normal Schools) when and where deemed desirable, to provide the instructors for them, and to outline the instruction; to designate high schools in which normal instruction may be given, to outline the course, and to inspect and approve the schools; and to make an annual report to the governor. He also serves, *ex officio*, as a member of the Board of Control for the state normal schools, and as a member of the State Library Commission.

For each county there is a county superintendent of schools, elected by the people, for two-year terms. To be eligible for the office the candidate must hold a first-grade county teacher's certificate in all counties having a population of over 1000 inhabitants, and his salary, as determined by law, cannot be less than from $1000 to $2200, according to the size of his county. It is his duty to visit each school in his county annually; to hold each summer a teachers' institute of one week duration; to forward all blanks and the state course of study to trustees and to teachers, and to examine and correct their reports when made to him; to change the boundaries of the school districts, and to transfer individual children; to adjudicate district disputes; to act, in general, subject to the instructions of the State Superintendent; to act for the state in holding examinations of teachers, and in issuing certificates to those who pass the examinations; to act as one of the Board of Regents for any county high school formed in his county, and as one of the board of district trustees for any school district in his county having less than three voters in the district; to certify to the State Superintendent the number of districts in his county entitled to state aid to enable them to maintain a five-months school; to assist in the enforcement of the compulsory education law; and to make an annual report to the State Superintendent.

Each county is divided into a number of school districts, there being about 7000 in the state, each of which is a body corporate. For each of these the people elect, in annual school meeting, a board of three district school trustees, electing them specifically as moderator, treasurer, and director. The moderator presides at all district board meetings; the treasurer has the custody of all district funds; and the director, or clerk, transacts most of the business for the district. The director has general charge of the schoolhouses and grounds; draws all orders on the district funds; takes the annual school census; may hire the teacher, under direction, and sign contracts; prepares an estimate of needs for the annual district meeting; and presents an annual report to the county superintendent. The district boards have general care of the schools; grade and classify them to fit the course of study as outlined; adopt and furnish free all textbooks, and may sell the same at cost to any pupil; may admit nonresidents, and expel pupils; may, by a two-thirds vote, contract with another school district or with a high school district to educate part, or all, of their pupils, and may provide transportation for part or all of the pupils. The annual district meeting, held in June of each year, votes the annual district tax; may vote a tax for a schoolhouse fund; determines the length of the school term, if any, beyond the minimum set by law; and determines all questions relating to selecting the school site or moving the schoolhouse. All residents of the district, owning property or having children, aliens and women included, may vote at these district meetings. The county superintendent, on petition of one third of the voters, may change the boundaries of a district, and on petition of one half may divide a district or consolidate two or more districts, except that no new district may be formed if it contains less than four sections of land or unless its valuation exceeds $15,000. Any district having 150 children of school census age (five to twenty-one) may elect a board of six trustees, who then designate their own officers, grade and classify the schools, may establish a high school, may prescribe the course of study and textbooks for the schools, and have general supervision of the schools. They present a report and estimate to the annual district meeting, which then votes the amounts required. Cities having 1500 or more inhabitants may be erected into separate city school districts, with similar powers.

Secondary Education. — In addition to the above, for districts having more than 150 school census children, any two or more rural districts may vote to unite to form a union rural high school, which is then supported by the districts so uniting in proportion to their assessed valuation. Any county may also vote to establish a free county high school, which is under the charge of a board of regents, consisting of the county superintendent of schools, the county treasurer, and three trustees elected by the district school directors of the county.

This board employs all teachers; estimates the amount needed each year, up to five mills, and certifies the same to the county commissioners for levy; and has the usual district powers for organization and control. The school must have five acres of land, and must teach manual training, domestic science, and agriculture in the ninth and tenth grades, and agriculture and normal training in the eleventh and twelfth grades. Diplomas of graduation are valid for teaching in the county for three years.

The free high school law also makes provision for four years of free high school education for all children in the state. Any pupil holding a certificate of graduation from the eighth grade may be admitted, on application of his parents to the county superintendent of schools, to any high school, if there is room. The district receiving such pupils receives seventy-five cents per week per pupil from the free high school fund of the district from which the pupil comes. This is an added tax and must be levied for the purpose, unless such district is unable to provide a nine-months elementary school. The schools follow courses of study made out by the State Superintendent of Public Instruction and the University of Nebraska.

Teachers and Training. — The system of certification for teachers is a state system in process of evolution. Both state and county forms of certificates are issued, but the questions for the county examinations are now prepared and the answers read and graded in the State Superintendent's office. The county superintendent still issues the certificates, but on the basis of grades reported to him from the state office, and the county certificates are valid, at the discretion of the county superintendent, for a variable period. Within recent years there has been a marked extension of the principle of granting teachers' certificates on the basis of credentials from educational institutions, until now the provisions for this are very liberal. The state also has made a commendable beginning in the interstate recognition of credentials. To teach in a high school, the teacher must hold a first-grade county certificate, or be a graduate of a normal school, college, or university. Fees are charged for all teachers' examinations and registering of certificates, to pay for the expense of grading papers, and to provide a teachers' institute fund.

For the training of future teachers the state maintains three state normal schools, at Kearney, Wayne, and Peru. These are large schools. The state also maintains eight so-called "Junior Normal Schools," located in eight cities in different parts of the state. These hold sessions of six to eight weeks during the summer months, enroll from 100 to 250 students, and one week of the session constitutes the summer institute of the county where held. The public school buildings and apparatus are used for the sessions, the instructors are appointed by the State Superintendent, and the course of instruction is that of the elementary course of the state normal schools, in which proportionate credit is given for the work done in these summer schools.

For the training of teachers for the rural schools the state grants $350 per year to all high schools providing normal instruction in the eleventh and twelfth grades, when approved by the State Superintendent. Graduates of these schools receive a second-grade county certificate, and the number of such schools and graduates is increasing rapidly. In 1908, 65 approved high schools graduated 550 teachers; in 1909, 98 schools graduated 763 teachers; in 1910, 109 schools graduated 894; and in 1911, 112 schools graduated approximately 1025. These schools are rapidly raising the standard of efficiency of the rural schools of the state.

School Support. — Nebraska originally received the 16th and 36th sections for schools on its admission to the Union, a total of 2,702,044 acres. The 500,000 acres of land granted to new states for internal improvements, and the 5 per cent from the sale of government lands within the state, were also added to the school fund. About one half of this grant has been sold, and almost all of the remainder is under lease. The present fund stands at about seven millions, and the probable future of the fund is about twenty-five millions. The interest on this fund is apportioned to the counties on the sole basis of census, and from the counties to the districts, one fourth equally to all districts and three fourths on census. Almost the entire support of the schools of Nebraska comes from local taxation, which may go as high as 25 mills in districts and 3.5 mills in cities, but with the proviso that in districts having four children or less the total tax must not exceed $400, and in districts of five to sixteen children it must not exceed $50 per child. Additional taxation, up to 10 mills, may be levied for a schoolhouse building fund. In all districts levying the maximum tax, the state will grant additional aid to enable them to maintain a five-months school, provided the total annual expense does not exceed $275. For this purpose the state now appropriates $75,000, and a similar sum is appropriated for normal training in high schools. These sums are regarded as in part compensating for the state school tax of one half cent, withdrawn in 1907. Fines and liquor licenses go to the local government unit imposing them.

Educational Conditions. — The state is essentially a rural and an agricultural state. There are few large cities, and three fourths of the people live in the rural districts; 99 per cent are white, and about 85 per cent native born. The illiteracy in 1900 was the lowest (2.3 per cent) in the Union. The conditions for education are good. The state has recently become deeply interested in the teaching of agriculture and domestic science, and these subjects, begun in 1905, are being rapidly introduced into the schools. Boys' and girls' clubs have been formed in many places, the enrollment in 1910 being over 32,000. High schools have experienced a rapid development within the past decade, and the training of teachers has made rapid progress. School libraries have recently been provided for, and ten cents per pupil may be set apart each year for a library fund. A state library commission of five suggests books for purchase.

The state has a fairly good compulsory education law, which all districts must enforce. There is also a reasonably good child labor law. Children seven to fifteen, in all districts, must go to school at least two thirds of the school term, and not less than twelve weeks each year, and, in cities, children seven to sixteen must go to school all the time the schools are in session. Deaf children, seven to eighteen, must attend the state school. Exemptions are granted for good reasons; attendance at parochial or private schools may be accepted; the school may appoint physicians to examine as to health and disabilities; and children fourteen to sixteen may work, if attending evening schools. All cities must appoint truant officers, and may provide truant schools. All other districts must enforce the law, and may call upon the county superintendent to assist. The school census, when taken, must be taken with a view to assisting in the enforcement of the compulsory education law. All children of paupers in county poorhouses must be sent to school at the expense of the county.

Higher and Special Education. — The University of Nebraska, a large and rapidly growing institution (*q.v.*), in Lincoln, stands as the culmination of the public school system of the state. This institution includes both the university proper and the Agricultural and Mechanical College, though the legislature of 1911 voted to establish another agricultural college in the western part of the state. Besides the state university, the following institutions of higher learning exist within the state, all being open to both sexes: —

Name	Location	Opened	Control
Doane College . .	Crete	1872	Congr.
Hastings College . .	Hastings	1882	Presby.
Bellevue College . .	Bellevue	1883	Presby.
Nebraska Wesleyan University . . .	University Place	1888	M. E.
Cotner University .	Bethany	1889	Chr.
York College . . .	York	1890	U. B.
Union College . . .	College View	1891	7th D. Adv.
Grand Island College	Grand Island	1892	Bapt.

The state maintains, as special institutions, the Girls' Industrial School at Geneva; the Nebraska State Industrial School for Boys at Kearney; the Nebraska Industrial Home at Milford; the Nebraska Institution for the Blind at Nebraska City; the Nebraska School for the Deaf at Omaha; and the State Institution for Feeble-minded Youth at Beatrice.

E. P. C.

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NEBRASKA, UNIVERSITY OF, LINCOLN, NEB. — A state institution established by act of legislature in 1869. It consists of five colleges (graduate, arts and sciences, teachers', engineering, law) and two schools (pharmacy and practice high school), situated on a six-block campus only three blocks distant from the business center of the capital city of Lincoln, a college of agriculture and a school of agriculture located on a 320-acre campus two miles and a half east of the city campus; a college of medicine located in the state's metropolis of Omaha, and a second school of agriculture recently located at Curtis, in the western portion of the state. In addition, the university is affiliated with the Lincoln Dental College, and several of the departmental experts of the university have been made *ex officio* specialists in the general employ of the state. The university also has supervision over experiment stations at Lincoln, North Platte, Valentine, Scotts Bluff, and Culbertson.

The university has its general outline prescribed by the state constitution, and the details of its organization determined by various acts of the state legislature. Administrative control centers in an elected board of six regents and a chancellor chosen by the board of regents, but the development of educational policies within the university is largely left in the hands of a senate consisting of heads of departments and the deans and faculties of the various colleges.

The chief source of revenue for maintenance of the university is a legislative tax of one mill upon the grand assessment roll of the state. Additional revenues are derived from lease and sale of lands granted to the state by the federal government, from federal money grants under the congressional acts of 1887, 1890, and 1906, from interest on permanent fund investments, and from various small fees paid by students.

In 1912 the equipment of the institution consisted of nearly thirty buildings of various sizes, the instructional staff numbered over three hundred, the student registration totalled 3657, the number of graduates for the year was 375, and the alumni roster showed an accumulation of over 5000 names. The entrance requirements are fifteen units of high school work. The usual university degrees are conferred on the completion of the appropriate courses. C. E. P.

NEBRASKA WESLEYAN UNIVERSITY, UNIVERSITY PLACE, NEB. — An institution under the control of the Methodist Episcopal Church, organized in 1887 by a union of the denominational institutions founded earlier at York, Bartley, and Central City. In place of these struggling institutions there now exists one vigorous university having, in 1912, an enrollment of nearly 1000. The campus consists of forty-four acres, including an athletic park. The main buildings are four in number. The total equipment is valued at $350,000. The productive endowment is $350,000.

The departments are as follows: college of liberal arts, teachers' college, academy, conservatory of music, school of expression and oratory, and school of art. Among these departments, the college of liberal arts has the highest enrollment, numbering three hundred and seventy-three. The faculty consists of forty members. F. A. A.

NEBRESSENSIS (DE LEBRIXA), ANTONIO. — See RENAISSANCE AND EDUCATION.

NECESSITARIANISM. — See DETERMINISM; WILL; FREEDOM OF THE WILL.

NECKER DE SAUSSURE, MME. ADRIENNE ALBERTINE (1765–1841). — French writer. She was married to Jacques Necker, nephew of his more famous namesake of the Revolutionary period, and is known in the educational world largely on account of her *L'éducation progressive, ou étude sur le cours de la vie* (1828–1838), crowned by the Academy (1832). This is one of the most interesting contributions to French educational literature. Like so many similar undertakings,— a work in several volumes whose publication drags out over a period of years, — it is characterized by a lack of unity. The point of view changes several times, although in the end the author pursues her original purpose and confines herself to "the education of women." All her writings are dominated throughout by a strong religious influence. Her work was translated in part into English soon after its appearance by Mrs. Willard and Mrs. Phelps (Boston, 1835), and in 1839 two volumes were translated anonymously in London. F. E. F.

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NEEDLEWORK. — See HOUSEHOLD ARTS.

NEEF, JOSEPH (1770–1854). — A colleague of Pestalozzi who established the first Pestalozzian schools in the United States. He was born at Soultz, Alsace, Dec. 6, 1770. He was educated for the priesthood, but gave up the notion of taking orders and entered the army of Napoleon. He was wounded in the battle of Arcole, Italy, in 1796, and three years later joined Pestalozzi as instructor of gymnastics in the institution which the great Swiss educator was conducting at Burgdorf. In 1803, at the request of Jullien and other French apostles of Pestalozzi, Neef was sent to Paris to open a Pestalozzian school. Here three years later he was engaged by William Maclure (*q.v.*), an American philanthropist, to come to Philadelphia and establish a Pestalozzian school. The school at Philadelphia was in existence for several years, when it was removed to Village Green, Delaware County, Penn. David Glasgow Farragut, subsequently the famous American admiral, was a pupil in the Village Green school. Later Neef moved to Louisville, Ky., where he engaged in educational work. With the establishment of the social colony at New Harmony, Ind., by Robert Owen (*q.v.*) and William Maclure in 1825, Neef was invited to join the community in the capacity of schoolmaster. When the colony broke up in 1828, he went first to Cincinnati and later to Steubenville, Ohio, where he conducted schools. In 1834 he returned to New Harmony, where he died April 8, 1854. In his educational labors in America, Neef followed in the main the methods of Pestalozzi. He abolished books from the lower classes and gave instruction by oral means; he taught nature and geography by field lessons; music and gymnastics were given important places in his educational scheme, and pupil government administered the necessary discipline. His *Plan and Method of Education,* published at Philadelphia in 1808, was the first strictly pedagogical work in the United States published in the English language. It is a comprehensive survey of the aims and methods of education in a style that is singularly clear and forceful, although written by a foreigner. In 1809 he published an English translation of the logic of Condillac, and in 1813, *Method of instructing Children rationally in the Arts of Reading and Writing.* W. S. M.

See MACLURE, WILLIAM; PESTALOZZI.

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NEGATIVE NUMBERS. — Among the artificial numbers (see NUMBER) is a domain of negative numbers. If $2 + x = 0$, x is evidently not a positive integer, and neither can it be a positive number of any kind. It must be such a number as will cancel 2 when added to it, and it is called a negative number. Because $2 - 2 = 0$, it has come to be the custom to represent x in this case by -2, where the negative sign is a symbol of quality and not one of operation. Hence we have two meanings for the negative sine, as, indeed, we have for the positive sign.

Negative numbers were slightly recognized by Diophantus (*q.v.*) and the Hindu algebraists (see ALGEBRA), but it was not until Descartes (*q.v.*) had worked out his suggestion for analytic geometry (*q.v.*) that they came to be well understood. Since the seventeenth century they have been generally recognized as valuable adjuncts to work in algebra, although an occasional mathematician (like Frend, the father-in-law of De Morgan) has declined to use them. Their value in physics has now been so fully recognized that they have an added importance in algebra.

The negative number is, at present, generally introduced early in algebra. This was not formerly the case, but so many simple and practical illustrations of these numbers are now known as to make their early use entirely feasible. Among the simple illustrations are north and south latitude, east and west longitude, above and below zero on the thermometer, assets and debts, weight and the upward pull of a balloon, and the " tug of war " in pulling a rope. Pupils in algebra have no difficulty in comprehending the significance of these numbers if they are illustrated in such a manner.

Some effort has been made to use different symbols for the negative as an adjective and the minus sign as indicating subtraction. Thus we have ^{-}a for the former and $-a$ for the latter. The effort has not, however, met with much favor in the mathematical world.

A slight effort has also been made by teachers to use the expression " negative a " instead of " minus a " in speaking of the quantity, reserving " minus " for the operation only. This effort has never commanded much attention, although it is a rather harmless distinction for a beginner to make. The fact is that mathematical usage allows " minus a " and does not adapt itself readily to the longer expression " negative a." D. E. S.

NEGLECTED CHILDREN. — See CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; CRIPPLED CHILDREN, EDUCATION OF; JUVENILE DELINQUENCY; PENOLOGY, EDUCATIONAL ASPECTS OF; REFORMATORY EDUCATION.

NEGRO, EDUCATION OF THE. — The English people who sent out the first colonists were interested in the religious education of the Indians. When the number of slaves increased, they became interested in the education of the negroes, who were then also a " heathen people." The first public school in Virginia, established about 1620, was for the benefit of these Indians and negroes. This school was destroyed in the Indian war of 1622 and little or nothing was done to educate either of them until the year 1701, when a society was organized in England to carry the gospel to the Indians and the negroes in America. In 1702 Samuel Thomas, the first missionary of the society, stated that he had taken much pains to instruct the negroes and taught twenty of them to read. Elias Neau, a French Protestant, in 1704 established a catechizing school for the Indian and negro slaves in New York, which continued successfully for a number of years.

The Moravians, in 1738, established missions exclusively for negroes. In 1745 the Society for Propagating the Gospel in Foreign Parts (*q.v.*) established a school in Charleston. Its pupils at one time were as many as sixty, and about twenty were sent out annually " well instructed in the English language and the Christian faith." When slavery was introduced into the colony of Georgia in 1747, representatives from twenty-three districts met in Savannah and drew up resolutions in regard to the conduct of masters towards their slaves. It was declared " that the owners of slaves should educate the young and use every possible means of making religious impressions upon the minds of the aged." In 1747 the Presbyterians began the religious instruction of the negroes in Virginia.

In 1750 the Rev. Thomas Bacon, himself a slaveholder, established in Talbot County a mission for poor white and negro children. The Methodist Conference of 1790 raised the question, " What can be done in order to instruct poor children, white and black, to read? " The reply was, " Let us labor as the heart and soul of one man to establish Sunday schools in or near the place of worship. Let persons be appointed by the bishops, elders, deacons or preachers, to teach gratis all that will attend from six in the morning till ten, and from two in the afternoon till six, where it does not interfere with public worship. The council shall compile a proper schoolbook to teach them learning and piety."

There was, however, some opposition to the education of slaves. This opposition grew as slavery became more of a political than an economic institution. In 1740 the colony of South Carolina passed a law imposing a fine of one hundred pounds upon any one who should teach any " slave or slaves in writing in any manner whatsoever." Georgia, in 1770, passed a similar law, which imposed a fine of twenty pounds upon any person teaching a slave to read and write.

Immediately after the Revolutionary War there was a feeling all over the United States that slavery was soon to pass away. The invention of the cotton gin, however, increased the value of slave labor, caused the belief that it was necessary to the economic growth of the South, and finally this belief to become a conviction that slavery was to be a permanent institution in the Southern states. This change in public opinion was reflected in the laws. Virginia, in 1819, passed an act prohibiting all meetings of slaves, free persons, and mulattoes in the night or in any school or schools for teaching them reading and writing. In 1829 Georgia passed a law forbidding any person of color to receive instruction from any source. In 1830 Louisiana passed a law forbidding free negroes entering the state and persons of color being taught. North Carolina, in 1835, abolished the schools for free persons of color, and enacted a law that no descendants of negro parents to the fourth generation should enjoy the benefits of the public school system. Mississippi and Missouri passed similar laws. In spite of these severe laws, negroes in one way or another managed to receive some education. In New Orleans, Charleston, Savannah, and other places there were clandestine schools attended by the children of free negroes and sometimes of slaves. Schools for free colored people were never abolished in Maryland, Kentucky, Tennessee, Florida, and Texas.

Up to a few years before the Civil War, there was almost as much opposition to negro education in the North as in the South. In 1831, at the First National Convention for Colored People, steps were taken to found a college for colored youth. In the course of the next year three thousand dollars was raised for establishing " a school on the manual labor plan." Several acres of land were bought in New Haven, Conn., for this purpose. The citizens of that city, however, raised a great cry and protested vigorously. At a public meeting presided over by the mayor it was resolved by a vote of seven hundred to four that " the founding of colleges for educating colored people is an unwarrantable and dangerous undertaking to the internal concerns of other states and ought to be discouraged," and that " the mayor, aldermen, common council and freemen will resist the establishment of the proposed college in this state by every lawful means." On the 3d of July, 1835, a town meeting was called in Canaan, N.H., and a committee chosen to remove Noyes Academy because it had enrolled several colored students. About a month later, the committee, aided by three hundred persons and a hundred yoke of oxen, literally carried out the instructions of the town meeting. Because Prudence Crandall, in 1833, at Canterbury, Conn., admitted colored girls to her boarding school, a law was passed making it a crime to open a school for negroes in that state, and she was imprisoned and mobbed. In spite of the opposition to negro education, the number of negro schools, primary and secondary, steadily increased. Of the secondary schools there exist: the Institute for Colored Youth, Cheyney, Penn.; the Avery Institute, Allegheny City, Penn.; and the Ashum Institute, now Lincoln University, Chester, Penn.

The outbreak of the Civil War increased the negroes' opportunities for education. Almost as soon as any portion of the seceding states was occupied by the Union Army, efforts were begun to give the refugees some schooling. In September, 1861, under the guns of Fortress Monroe, a school was opened for the " contrabands of war." In 1862 a number of similar schools were operated in Virginia, North Carolina, and South Carolina. On Dec. 17, 1862, Colonel John Eaton was ordered by General Grant to assume general supervision of freedmen in the departments of Tennessee and Arkansas. Under him, schools multiplied. In October, 1863, General Banks created commissioners of enrollment, who established the first public schools in Louisiana. March 22, 1864, he created a board of education " for the rudimental instruction of the freedmen." In December of this same year this board reported 95 schools, 162 teachers, and 9571 scholars. Education was also going on in the negro regiments, where thousands of soldiers persuaded their officers to become schoolmasters, and in this way learned to read, write, and cipher.

Congress on March 3, 1865, created the Freedmen's Bureau (*q.v.*). It was authorized to coöperate with benevolent or religious societies in the education of the negro. Numbers of these societies had done good work before the establishment of the bureau, and afterwards continued their work. Some of these organizations were the American Missionary Association, Western Freedmen's Aid Commission, American Baptist Home Mission Society, and the Society of Friends. After the surrender of Vicksburg and the occupation of Natchez, other teachers were sent by the United Presbyterians, Reformed Presbyterians, United Brethren in Christ, Northwestern Freedmen's Aid Commission, and the National Freedmen's Aid Association. Apart from the general government, the American Missionary Association was the chief body that supplied the educational needs of the negro. Up to 1866 the Freewill Baptists, the Wesleyans, the Congregationalists, and Friends in Great Britain sent their aid through the American Missionary Association.

After Appomattox the whole race started to school. The freedmen could not wait for schoolhouses to be built or for teachers to be provided. School was held anywhere and everywhere. The enthusiastic learners got up before day and studied in their cabins by the light of pine knots. They sat up until late at night, drooping over their books trying to master the secrets they contained. By a fire in the woods at night, a dozen or more people of both sexes and of all ages sat about with books in their hands studying their lessons. Sometimes they would fasten their primers between their plow handles, so that they could read as they plowed. Negro coal miners tried to spell out the words of a little reading book by the dim light of a miner's lamp, hundreds of feet below the earth. In the early days of freedom, public schools were not infrequently organized and taught under a large tree. Some of the early schoolhouses consisted of four pieces of timber driven into the ground and brush spread overhead to keep out the sun and rain. Night schools were very popular; men and women, after a hard day's work in field, shop, or kitchen, would spend two or three hours at night in school. Many got their first lessons in reading and writing in the Sunday schools, which frequently had more spelling books than Bibles. The teacher was likely to be any one who knew something some one else did not know. It sometimes happened that those who could read better than they could write became teachers of reading, and those who could write better than they could read, teachers of writing.

The number of regular schools rapidly increased; white teachers of all classes and both sexes came from the North. There were also numbers of negro men and women who, having escaped from slavery and gained some education in the North, now returned to become teachers of their race. There were also many Southern white people who, being left without occupation directly after the war, were glad to teach the freedmen in order to eke out a livelihood. In 1866 there were 975 schools and 90,778 pupils; the next year there were 1839 schools and 111,442 pupils. Ten years from this time the number of colored children enrolled in public schools of the sixteen former slave states and the District of Columbia was 571,506. In 1908 the number was 1,712,137, and the number of public school teachers was 30,334.

Immediately after the war many schools for higher education were established. In 1865 the Sixty-second and Sixty-fifth United States colored regiments generously contributed from their wages $6000 to found Lincoln Institute at Jefferson City, Mo. The same year Shaw University was started at Raleigh. Hampton Institute (*q.v.*) was founded in 1866 by General Samuel Chapman Armstrong. Fisk University was established at Atlanta; Biddle University at Charlotte; and Howard University, named after General O. O. Howard, at Washington, D.C. In 1869 Straight University was established at New Orleans; Tougaloo University at Tougaloo, Miss.; Talladega College at Talladega; and Claflin University at Orangeburg, S.C. (*qq.v.*). At present (1912) the United States Commissioner of Education reports 189 institutions devoted to secondary and higher education. No one of these institutions is devoted entirely to collegiate work, but in all of them are found some students of secondary grade, and in the most of them students of elementary grade. In almost all of these institutions some form of industrial training is given. There were, in 1910, 2941 teachers, and 57,915 students, of whom 23,896 were of elementary grade, 19,654 of secondary grade, 13,124 of collegiate grade, and 2080 professional students; 29,954 of the students were receiving industrial training, 11,943 males and 18,011 females. The Helen B. Cobb Industrial Institute, at Barnesville, Ga.; Ingleside Seminary, Burkesville, Va.; Mary Allen Seminary, Crockett, Tex.; Mary Holmes Seminary, West Point, Miss.; the Hartshorn Memorial College, Richmond, Va.; Scotia Seminary, Concord, N.C.; Spelman Seminary, Atlanta, Ga.; and St. Frances Academy, Baltimore, Md., are devoted exclusively to the training of females. Gammon Theological Seminary, Atlanta, Ga., and Stillman Institute, Tuscaloosa, Ala., are exclusively theological seminaries. Thirteen other institutions have theological departments. Two institutions have departments of dentistry, three of pharmacy, four of law, and seven schools of medicine.

Special funds which have done much for the promotion of negro education are the Peabody Fund (*q.v.*), created in 1867 and 1869, and devoted to the education of whites and blacks in the South; the John F. Slater Fund (*q.v.*), created in 1882 for the purpose of "uplifting the lately emancipated population of the Southern states and their posterity"; the Daniel Hand Fund, created in 1888 to aid the American Missionary Association in its work in the South; and the Anna T. Jeanes Fund (*q.v.*), created in 1907 to aid in the maintenance and assistance of elementary schools for negroes in the South.

When the negro was emancipated, probably not more than 5 per cent of the race could read or write. In 1900, after less than forty years of freedom, 55½ per cent could both read and write. In 1910, 30.5 of the negro population is illiterate. Although the negroes constitute over 11 per cent of the population and still have the largest proportion of ignorance, yet they receive only about 2 per cent of the total amount expended for education. The total yearly income of all negro schools for industrial and higher education is not more than two and a quarter million dollars, which is less than the income of Harvard University in 1908. The yearly expenditure per capita of total school population for common schools is $15; for colored schools it is $1.71.

The most pressing needs of negro education are better common schools, particularly in the rural districts. There should be more careful and complete supervision of the common schools and more teaching of the fundamental industries, agriculture, cooking, sewing, etc. Some of the larger institutions should be endowed so that, by means of extension work and continuation schools, they would be able to come into touch with the actual needs of the masses of the people. There should be more technical and industrial schools. Particularly is there need of a normal high school where teachers may be thoroughly prepared to do the work of supervision in the common schools and where they may learn by actual practice something of the methods which are being worked out in various parts of the country for carrying the influence of the schools outside of school buildings and connecting it with the practical work and life of the community. See SCHOOL PLANT, WIDER USE OF.

The present tendency of negro education is to develop along those lines that minister to the actual needs of the people. This is seen in the growth of medical and nurse training schools, the attempt to adjust the courses of colleges and universities to present-day needs, and the growth of what is known as "extension work." In this connection it should be remembered that negro education has already contributed something to the people of the United States. Before the beginning of Hampton Institute, no educational institution gave any systematic instruction in the industries. Industrial education for the negro antedates even manual training, which was not introduced into the United States until 1876. The success of Hampton and Tuskegee institutes and of other and similar negro schools has made industrial education popular, and has not only changed the sentiment of the masses of the negro people in regard to labor with the hands, but has also helped in introducing it into Northern schools and white schools of the South. The present tendency is to connect all forms of education in some way with the daily life and needs of the people. B. T. W.

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NEO-HUMANISM. — A term sometimes applied to the revival of the Hellenic ideal in German thought in the latter part of the eighteenth century. It differed from the humanism of the fifteenth century in its attachment to Greek rather than Latin culture; in a greater interest in Greek antiquities and art in general as compared simply with literary records, and in appeal to Greek culture as affording an ideal conception of life. Serenity, balance, a recognition of the inevitable limitations of life, the striving for a symmetrical development within these limits, the idea of the central place of a free play of the intellectual powers in securing this proportionate development of all human powers, are some of the traits emphasized and attributed to the Greek view of life. To these must be added the claim of spiritual and intellectual kinship with the Greeks which the Germans put forward. Winckelmann and Goethe are the chief names in this new humanism, the former with his archæological researches, and the latter in his reaction against romanticism signalized by his *Italian Letters.* In nineteenth-century English thought, Matthew Arnold is a typical representative of the spirit of Neo-humanism in his conception of culture and his appeal for recognition of Hellenism as well as Hebraism.

In the gymnasiums and universities of Germany, Neo-humanism exercised a powerful influence. A new vigor was imparted to the classical studies, but more especially to the study of Greek. No longer content with the merely linguistic, an effort was made to imbibe the Greek spirit by a study of Greek life and literature in all its phases. In Germany this is the period of her most brilliant classical scholars. J. D.

See CULTURE; HUMANISM AND NATURALISM; GERMANY, EDUCATION IN; GOETHE; HERDER; WOLF, F. A., etc.

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NEO-PLATONISM. — Neo-Platonism is the final form of Hellenic philosophy as it employed, in the latest or religious phase of ancient philosophy, the leading principles of Platonism, though not a little modified, combined with elements derived from Aristotle, Stoicism, and Neo-Pythagoreanism, and possibly even from the East, to solve, by a philosophy resting upon a religious basis, the problems of knowledge and virtue which later Stoicism had presented but could not answer. The ethical philosophies of the period immediately before and after the Christian era had ended in the confession of the impossibility of man's attaining virtue by his own effort, on account of the inherent evil in his nature, and a skeptical tendency as to the attainment of ultimate truth by any purely rational process. Neo-Platonism attempted to overcome this result by a metaphysical system which at once explained it and showed the way to attain the highest knowledge and good by a suprarational experience in which the individual obtained an immediate experience of the divine. The elements not proper to Greek thought appearing in Neo-Platonism are in harmony with the religious speculation current in Alexandria and derived possibly from oriental religions. They certainly first appear in the philosophy of Philo, and although no direct relation between that Jewish philosopher and Neo-Platonism can be traced, the resemblance must be more than a chance coincidence.

There are three schools of Neo-Platonism distinguished as to time, locality, and character. Of these the Alexandrian is the earliest and most important in the history of thought. It is the creative period of Neo-Platonic speculation and finds its expression in the works of Plotinus (204–270) and his disciple Porphyry (233–*c.* 304). It was at Alexandria that Plotinus developed the first elements of his system under the influence of Ammonius Saccas, the traditional founder of Neo-Platonism. It was at Rome, however, that Plotinus lived and taught in his school of philosophy. Here also Porphyry lived, editing the works of his master and teaching philosophy, not merely that of his master, but that of Aristotle, on whose work he wrote valuable commentaries. The Roman period of Neo-Platonism is by far the most interesting, as its aims were predominantly metaphysical and ethical. Religious as it was in its fundamental principles, it yet did not surrender philosophical interests to further positive religion. The Syrian school of Neo-Platonism is represented by its founder Iamblichus (*d.* 330), who degraded Neo-Platonism by exaggerated emphasis upon the magical or theurgic elements which had only been lightly touched upon in the works of Plotinus. In this phase, Neo-Platonism became less a philosophy and more a religious dogmatic system, a justification of theurgy and a guide to proficiency in magical arts. The Athenian school is represented by a group of teachers at Athens, the leading seat of the later study of heathen philosophical classics, and it flourished until the closing of the school in 529 by Justinian. Of these teachers by far the most important was Proclus (410–485) one of the scholarchs. In his works we have a quasi-scholastic attempt to weld into a consistent body of doctrine the teaching of the .various philosophers of the school, avoiding the alliance with positive heathen religion, as there was not longer any hope for its resuscitation. Proclus gave the form through which Neo-Platonism affected Christian Mysticism. (See MYSTICISM.) But though these three phases are clearly distinguishable in the history of Neo-Platonism, the movement was very widespread, and schools of philosophy were to be found in many cities sharing the common impulse given by Plotinus to metaphysical speculation and differing in many minor points.

Neo-Platonism came into conflict with Christianity first in the period just before the end of the heathen empire, when Porphyry attacked Christianity with vigor and great critical ability. Yet Porphyry himself turned with increasing hostility against the crudities of heathenism and was as unsparing as any Christian apologist in denunciation of the immoral mythology of heathenism. He acknowledged the personal worth and character of Christ, but denounced the practice of Christians of worshiping him. The Christian writings were to him base forgeries. But the breach between the two systems, which in metaphysical outlines had been hardly apprehended as hostile, widened, and, under the influence of Iamblichus and his teaching, Neo-Platonism began to associate its fortunes with the fortunes of paganism, and everything was done to establish paganism upon a speculative basis.

Neo-Platonism failed in several points as a system likely to become generally acceptable. Its appeal was necessarily restricted to a select few. However low it might descend with Iamblichus, it always remained a metaphysical system. It failed to meet the simple popular demand for an historic personality to whom the heart could turn. In this the nearly allied system of Neo-Pythagoreanism had an advantage. And the attempt to employ Apollonius of Tyana as such was based upon sound judgment. Then, again, the doctrine of God in Neo-Platonism was so transcendent, colorless, and vague, so much like an hypostatized zero, that it could not touch the heart. Even when the language of St. Augustine (*q.v.*) is strongly reminiscent of Plotinus, there was always the personal touch established by the Incarnation and the personality of God. The ecstasy of Neo-Platonism might be an experience for the intellectual élite, but it had no promise for the multitude.

Although Neo-Platonism was always limited in its appeal, even in the school of Iamblichus its enthusiastic adherents had hopes of making it a universal religion under the patronage of Julian (361–363). But though the philosophical religion of that emperor gave free play to the superstitious and polytheistic elements of paganism, Neo-Platonism proved a dismal failure as a popular religion. It was naturally hated and despised by Christians, but it was ridiculed and contemptuously rejected by the heathen. The dull ceremonies and joyless services prescribed by Julian after a Christian model failed to satisfy their religious cravings and habits of worship. Its interminable philosophical harangues in imitation of Christian sermons gave nothing their minds could grasp. The very failure of Julian's attempt to make Neo-Platonism the State religion led to a reaction and to that relative sobriety which characterized the later school of Athens and found its expression in the writings of Proclus.

Though Neo-Platonism failed as a religion, as a philospohy it left a permanent impress upon the Christian world. In the East, the Pseudo-Dionysius made it the basis of his mystical theology. In the West, it left an abiding impression upon the theology of St. Augustine and his followers, especially in the doctrine of God and the negative character of evil. It was revived repeatedly by both heretics and teachers of unblemished orthodoxy in the Middle Ages, being identified with Platonism. Elements were introduced through the Arabians, Avicenna and Averroës. At the time of the Renaissance it was studied afresh in the original documents. Of its teachers under the Medici, the Greek philosopher Gemistus Pletho was the most important. Marsilius Ficinus (*q.v.*) translated Neo-Platonic works. Pico di Mirandola and Reuchlin also studied it. Giordano Bruno and Jacob Böhme show its influence. Fichte and Hegel, and especially Schelling, show many affinities with the speculative elements and methods of Neo-Platonism, and it has become a common possession of various forms of mysticism.

J. C. A., Jr.

See Innate Ideas; Mysticism.

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NEPOS, CORNELIUS. — A Roman historian of the first century B.C. (*c.* 100–24), wrote, among other works a series of parallel biographies of famous Greeks and Romans in sixteen books (*De viris illustribus*). There remain only the part treating of foreign generals, and the lives of Cato and Atticus.

These biographies are as a rule very brief and have long been a favorite material to put into the hands of young students of Latin. The style, however, is not pure, and the tendency to abstract analysis of character renders the mill adapted to children. Their contents, too, are often dull and uninspiring. Partly for these reasons, Nepos has been read less and less in schools in recent years, except for supplementary study. When read he belongs to the second year, alongside of Cæsar. There is no lack of adequate school editions. An exhaustive study has been made of his style by Lupus (*Der Sprachgebrauch des Cornelius Nepos,* Berlin, 1876).

G. L.

NERVE. — See Nervous System.

NERVE IMPULSE. — See Nervous System.

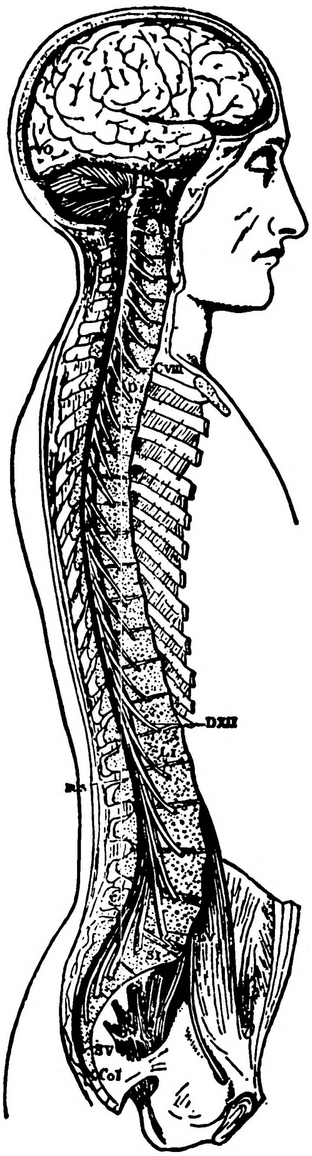
NERVOUS CHILDREN. — See Defectives; Neurasthenia.

NERVOUS DISEASES. — See Mind, Diseases of; Neurasthenia.

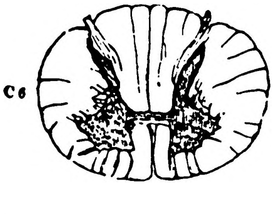
NERVOUS SYSTEM. — All nervous tissue in the body, whether in the nerves or in the nerve centers, forms a single connected system. Formerly the "sympathetic system," with its ganglia and nerves supplying the viscera, blood vessels, etc., was regarded as relatively independent of the cerebrospinal system; but present information indicates that the sympathetic is simply an adjunct of the other. The sense organs, though not reckoned as parts of the nervous system, are connected with the sensory or afferent nerves — the retina with the optic nerve, the organ of Corti with the auditory nerve, the taste buds with the nerves of taste, and the touch corpuscles and other sensory end-organs in the skin and throughout the body with numerous sensory nerve fibers in the mixed nerves. The muscles and many of the glands are connected with the motor or efferent nerves. Thus the *system,* as a working whole, contains, besides the nervous system, the "receptors," through which the environment acts on the organism, and the "effectors," by which the organism reacts upon the environment. The part played by the nervous system is primarily that of affording a quick means of communication between the receptors and the effectors.

Spinal Cord. — From the brain and spinal cord, nerves ramify to all corners of the body.

The brain, protected by the skull, and the cord, extending down the back within the spine, are continuous with each other through a hole in the base of the skull. The cord appears like a large nerve, one half to one third of an inch in diameter, with "enlargements" at the height of the shoulders and at that of the loins. The upper enlargement is the source of the nerves to the arm, and the lower enlargement of those to the legs; and they are the lower or local centers for reflexes of the limbs.

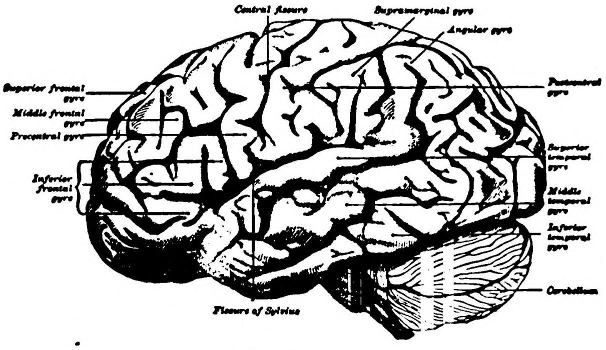


The cord is white outside, as the nerves are; but a cross section reveals something not found in the nerves, namely, gray matter. The cord is nearly divided into right and left halves by grooves or fissures extending along both its dorsal and its ventral surface, but there remains a connection or "commissure" between the two lateral halves. In each half, the gray matter shows dorsal and ventral portions or "horns," the ventral being, in the enlargements, large and fat, while the dorsal horn is always rather slender. The nerves come off from the cord by the dorsal and ventral "roots," of which there are a whole series on either side of the cord. It is a remarkable fact that though the nerves as they run through the limbs and other parts of the body are "mixed nerves," containing both sensory and motor constituents, these are segregated on entering the cord, and all the sensory nerve fibers enter the dorsal root, close to the dorsal horn of the gray matter, while all of the motor fibers enter the ventral roots. In fact, during the embryonic growth of the nervous system, the motor nerves grow out from the ventral horn of the gray matter, while the sensory nerves grow, not out from the cord itself, but from the "spinal ganglia," masses of nerve cells lying close outside the dorsal portion of the cord.



The white matter of the cord, lying outside the gray, is spoken of as divided into "columns," dorsal, ventral, and lateral. The dorsal columns are direct continuations of the dorsal roots, and consist, therefore, of sensory fibers which have come in from the nerves and are proceeding towards the brain. The lateral and ventral columns contain many sets of fibers, some conducting upwards and some down, some being short and others long.

Brain. — The brain consists of the "brain stem," a continuation of the cord, and two large outgrowths, the cerebrum and cerebellum. The brain stem lies along the floor of the skull, from back to front. Its rear or lower portion, next to the cord, is the "medulla" or "bulb"; in front of this is the "pons" and next the "midbrain"; then the "interbrain" or "thalamus," and finally the basal portion of the "end-brain." The great bulk of the end-brain consists of the cerebral hemispheres, which are outgrowths from the more primitive basal portion of the end-brain; the cerebellum is an outgrowth from the pons.

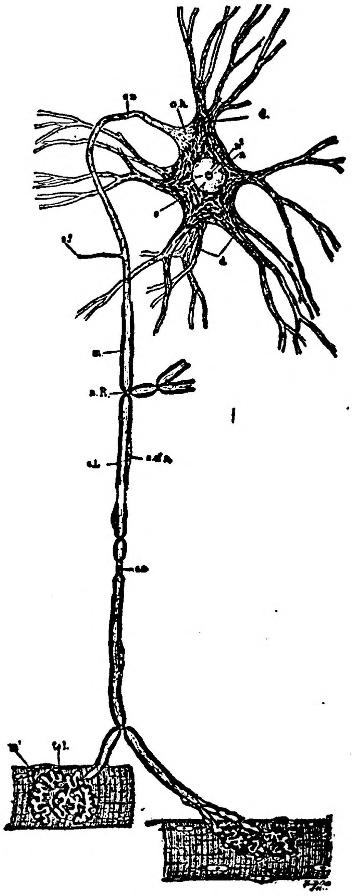


The nerves of the head issue from the brain stem; that to the nose from the end-brain; that to the eye from the interbrain; those to the muscles of the eyeball chiefly from the midbrain; that to the skin of the face from the pons; those to the ear and to the throat and rear of the mouth from the medulla. Where the nerves from any part enter, there are the lower centers for that part. The medulla receives the "vagus" nerve, which supplies the heart, lungs, and stomach; and the medulla accordingly contains the respiratory center and the cardiac center, as well as a vasomotor center which regulates the constriction and dilatation of the blood vessels, and a center which influences the activities of the stomach. The medulla, it will be recognized, is an extremely vital part; without it, respiration is impossible, and accordingly destruction of the medulla is, in one form or another, a favorite means of capital punishment.

The end-brain, or cerebrum, is almost separated into hemispheres; these are, however, joined at the base, and are connected also by the " corpus callosum," a large bundle of nerve fibers, which practically unites the hemispheres into one organ. In the cerebrum, as well as in the cerebellum, the arrangement of white and gray matter is different from that which obtains throughout the cord and brain stem, in that the gray matter lies on the external surface, forming a bark or rind or " cortex." The external surface of both the cerebrum and cerebellum is much folded, with the result that the area of the cortex and the amount of gray matter are much larger than would be the case with a smooth surface. The surface of the cerebrum is spoken of as divided into the frontal, parietal, occipital, and temporal lobes, the frontal and parietal being separated by the central fissure (or fissure of Rolando), and the frontal and temporal by the lateral fissure (or fissure of Sylvius). There are many minor fissures, subdividing each lobe into convolutions or gyres. Thus, from above downward, the frontal lobe contains the first, second, and third frontal convolutions, and the temporal is similarly divided. The precentral and postcentral convolutions border the central fissure. These subdivisions have value as landmarks, but do not usually indicate inner or functional division of the brain.

Growth of the System. — The development of the nervous system begins, very early in embryonic life, with the appearance of a " neural groove " extending along the back, and a little later arching over into a tube, the " neural tube." It is the outer layer of the embryo from which the neural tube originates, but this is crowded inwards and surrounded by the growth of muscle and bone. The neural tube at its forward end becomes expanded into a series of five vesicles, which develop into the five principal parts of the brain: end-brain, interbrain, midbrain, hind-brain (including pons and cerebellum), and after-brain or medulla. In spite of the complicated form into which it grows, the neural tube remains always a tube, with a hollow extending along the spinal cord and brain stem and into each cerebral hemisphere. The hollow of the tube is expanded into the " ventricles " of the brain. Along with the neural tube, there are infolded two little strips of the external surface of the embryo, and these give rise to the sensory and sympathetic nerves and ganglia. The motor nerves arise from the neural tube itself. It is interesting to note that the retina, the sensitive surface of the eye, arises from the neural tube, and is therefore to be regarded as part of the brain; it has indeed a distinctly nervous structure.

Nerves. — The minute structure of the nervous system is more important to understand than the gross structure which has already been sketched. Microscopic study of the nerves shows them to be bundles of fibers running parallel to each other, like wires in a telephone cable. The white matter of the cord and brain is essentially the same as the nerves, being composed of nerve fibers. The unit is the fiber, which, on microscopic examination, is seen to consist of a central core, called the axon, surrounded by one or two sheaths. In most of the nerves, each axon has two sheaths, called medullary and primitive, the latter being outside. In the white matter of the cord and brain, the primitive sheath is lacking, but the medullary is present; while in sympathetic nerve fibers the reverse is true. The medullary sheath is composed of a white, fatlike substance, which has some of the physical properties of an insulator and may have a somewhat similar function. It is this substance which gives whiteness to the white matter.



The gray matter differs from the white in the absence of the medullary sheath, and in the presence of nerve cells, which are absent from the white matter and from the nerves, except for the sympathetic and spinal ganglia attached to the nerves. The fine branches of the nerve cells and of the fibers are also confined to the gray matter. The gray matter consists of numerous nerve cells embedded in a meshwork of minute fibers. It presents a most complicated problem to the microscopic anatomist who would analyze it; but, considering the difficulties involved, extraordinary progress has been made. It is found that every nerve cell, if at all fully developed, sends out a long, slender branch, the axon, which, becoming invested with a medullary sheath, emerges from the gray matter into the white, and appears there as a nerve fiber. The axon, in other words, is a branch of a nerve cell, and there seems little reason to doubt that all the axons of the nerves and white matter originate from cells in the gray matter. Besides the axon, the nerve cell has other branches of a different sort, short and branching like a tree, from which fact they have received the name of "dendrites." These differ from the axon, also, in receiving no medullary sheath and in never extending beyond the bounds of the gray matter. The axon, in general, branches much less than the dendrites, and its branches (called "collaterals") are slender and usually at right angles to the main trunk. But the axon, and each of its collaterals, finally comes to an end in a tuft of fine branches, always turning into the gray matter to terminate in this manner; there are no terminations of axons within the white matter. Apparently the numerous fine fibers of the gray matter are accounted for as dendrites and fine terminations of axons; and if so, we can conceive the gray matter as consisting of nerve cells embedded in a dense mat of their own branches and of the branches of other cells and axons.

Under high magnification, the inner structure of the nerve cell shows a nucleus, similar to that found in every living cell, and — what is peculiar to the nerve cell — numerous delicate fibrils, coursing in different but definite directions through the cell body and out into the axons and dendrites. In the axon, these fibrils run strictly parallel to one another. It is believed by some authorities that the fibrils are the ultimate conducting agents. The cell body and larger dendrites show another feature that is absent from the axon: granules of triangular or spindle-shaped outline, called the chromatic bodies. The substance which gives this mottled or "tigroid" appearance to the nerve cells may be of the nature of fuel; at least, it has been observed to become diffused throughout the cell during prolonged activity, so that the fatigued nerve cell shows a diffused instead of a mottled color. Certain drugs and abnormal conditions also produce this condition, which is called chromatolysis.

Neurones. — A nerve cell, with its axon and dendrites and all the ramifications, is often called a *neurone.* This term is bound up with the "neurone theory," according to which the neurones remain separate one from another, and are not united into continuity. In embryonic development, the nervous system starts as a collection of unbranched cells, which later put forth axons and dendrites; and the question is whether the branches of different cells unite in the course of their development into a continuous meshwork. The best methods yet available fail to show any anastomosis of the branches of different nerve cells, though there is sometimes close adhesion. But some authorities oppose to the neurone theory a "fibrillar theory," according to which the minute fibrils already mentioned pass freely from one neurone to another, and, possibly, form in the interstices between neurones a network of the utmost tenuity, which, these authors think, is worthy to be called the essential part of the gray matter, since it would be the means of making connections between different nerve fibers and so between different parts of the body. As the evidence stands today, the neurone theory has a better standing and wider acceptance than the fibrillar theory, for the passage of fibrils from one neurone to another, or their presence in the spaces between neurones, has not been demonstrated.

Function of Nervous System. — The primary function of the nervous system is, without doubt, to conduct not materials, as the circulation does, but something in the nature of messages or stimuli, capable of arousing activity in the organs to which the nerves run. The "message" carried by the nerve is called, in the absence of any sure knowledge of its real character, the "nerve impulse." It may be an electrical change that moves along the nerve, since such a change can be detected in an active nerve, and nothing else — movement, heat, or chemical action — has been demonstrated. The speed of the nerve impulse can be measured, but in man the values obtained have varied all the way from 100 feet to 350 feet per second, with the more recent and improved methods favoring the higher values.

The function of the nerve fiber, and accordingly of the nerves and white matter, is certainly to conduct and nothing more. Axons appear to be insulated one from another in the nerves and white matter, so that no communication from sensory to motor, no switching or distribution of impulses, occurs except in the gray matter. It is likely, though not universally believed, that all nerve fibers act much alike, being indifferent conductors. What is called the "specific energy of a nerve" refers to such facts as that a jarring or any sort of stimulus to the optic nerve produces only sensations of light; but the specific energy may reside not in the optic nerve, but in the visual area of the cortex to which the nerve leads. The white matter and the nerves seem to be mere passive conductors. Everything that is active or variable with conditions or modifiable by experience is an affair of the gray matter. An adequate conception of the action of the gray matter can certainly not be formed in the present state of knowledge; but what seems a probable outline of its mechanism can be based on its structure along with the notion that the fundamental function of all nervous tissue is to conduct impulses.

Where formerly the nerve cells were looked upon as the essential things in the action of the gray matter, of late the view has gained force that they are nutritive in function, serving to keep their branches alive and in good working condition, and that the branches which interlace in the gray matter do the actual work. There is, in any minute portion of the gray matter, an intermingling of the dendrites of the cells located there with the terminations of axons which enter from other parts. For example, the axons coming into the cord or brain stem from a sense organ terminate within some mass of gray matter, in close contact with the dendrites of the cells of that gray matter; and in some cases it is perfectly clear that the incoming axons must transmit their activity (their "messages") to the dendrites of these cells. It is probable that the dendrites are receptive and the terminations of axons excitory or transmissive; so that a nerve impulse, entering the gray matter by an axon, passes from the terminations of this axon to the dendrites of another cell, and thence to the axon of that cell and so away to some other part of the gray matter or to some organ outside. The function of the terminations of axons and of the dendrites seems, therefore, to be that of effecting connections.

Since an axon, in its termination, may make connections with the dendrites of several cells, there is a chance for that distribution of influence which is the essence of coördination. Since several axons may terminate in proximity to the dendrites of a single cell, there is opportunity for the convergence and combination of impulses. The importance of a convergence of neural paths is especially seen in facilitation and inhibition. Two stimuli, acting on different sense organs, may reënforce or facilitate each other's action; or, one stimulus may prevent or inhibit the action of another. Thoughts and emotions, having their seat in the cerebrum, may either hasten or slacken the rate of breathing; and this means that they have reënforced or inhibited the reflex effect of sensory stimuli reaching the respiratory center in the medulla. There must be in all such cases a convergence of influences from two or more sources upon that part of the gray matter which is directly connected with the effector organs.

Sleep, drowsiness, and unconsciousness under the influence of drugs are conditions primarily of the gray matter, and are probably to be conceived as a temporary impairment of the connections between axons and dendrites. Learning, a process which seems to concern almost entirely the cerebral cortex, may be conceived as consisting in the improvement of connections through use, and forgetting as an atrophy of connections through disuse. Exercising dendrites or the terminations of axons may probably cause them to grow and improve in condition for work, as is known to be the case in muscular tissue.

The neurone theory, though primarily concerned with the structure of the gray matter, has proved a great aid in reaching a conception of the function. The name *synapse* has been applied to the junction, without continuity, of the termination of an axon with the dendrites of another cell. The proximity of the two may be very great, yet it does not amount to continuity such as holds between different portions of the same neurone. There is always a breach of continuity, or "surface of separation" between the interlacing branches of two neurones. Hence, it is probable that conduction through the gray matter is much slower than along a nerve fiber, and that impulses go in only one direction through the gray matter. The synapse has a sort of valve action on nerve impulses, permitting them to pass only in the direction from termination of axon to dendrites. The synapse is the susceptible part of a neural path or connection, where varying influences, such as are seen in facilitation and inhibition, take effect. The synapse it is, according to this conception, which is improved by learning and which deteriorates by disuse.

Since all sensory axons lead into the gray matter, and all motor axons originate in gray matter, the simplest form of action involving the nervous system is the reflex, in which a stimulus to a sense organ, acting through a sensory nerve, arouses to activity the gray matter from which issue the motor nerves to the reacting muscles. The "reflex arc" consists of the sensory or afferent nerve fiber, the synapse between this and the dendrites of a motor nerve cell and the axon of this cell. This is the simplest possible reflex arc, but it is probable that most reflexes have longer and more elaborate paths than this.

Localization of Functions. — It is clear from all that precedes that the nervous system does not act as a mass, in the way that the liver may be thought of as acting, but in detail, by means of particular paths and connections. Hence a large share of the vast amount of study that has been given to the brain and cord is concerned with the localization of function. In the white matter attention has been directed to disentangling the tangle of bundles that course through it, and that are called *tracts*. Purely anatomical methods need to be supplemented by physiological and pathological methods in order to trace out a tract from its origin, *i.e.* the portion of gray matter containing the cells from which its axons arise, to its termination, *i.e.* the portion of gray matter which its axons finally enter and where they terminate. Among sensory tracts in the cord may be mentioned the dorsal columns, which are apparently concerned with the muscle sense and not with the cutaneous senses, and the "spino-thalamic tract" in the lateral column, which is apparently the path of cutaneous sensation. Among motor paths, the one best worth mentioning is perhaps the cortico-spinal or pyramidal tract which, originating in the giant cells of the motor area, passes down through the brain stem, "decussates" or crosses, for the most part, in the medulla, and runs down the cord in the lateral column, terminating all the way along in connection with the motor cells of the ventral horn. "Decussation" is a curious fact regarding the tracts that lead into or out of the cerebrum. The decussations occur in various parts of the cord and brain stem, but all have for their effect to bring the right half of the body into connection with the left hemisphere and the left half of the body with the right hemisphere. Therefore, the left hemisphere controls the movements of the right hand, and also receives sensations from it.

The first indication of a localization of functions in the cerebral cortex — since the earlier effort of the phrenologists to localize the various faculties had proved abortive — was Broca's announcement that the third frontal convolution in the left hemisphere was connected with speech, and that its injury entailed aphasia (*q.v.*). Next, the "motor area" was roughly located, and since then areas for vision, hearing, touch (in the broad meaning), and smell have been determined. These sensory and motor areas are directly connected by fibers with the lower centers, which in turn are directly connected with the sense organs and muscles. The visual area, adjoining the calcarine fissure on the median surface of the occipital lobe, receives impulses from the retina, and any seen object that influences the cortex acts first on this area, and then, by association fibers, on other parts of the cortex. All sensory impulses first reach the cortex in certain limited areas and radiate thence by the very numerous association fibers to other parts. The motor area, extending along the front side of the central fissure, is the origin of the corticospinal and similar tracts, and the principal gateway through which the influence of the cortex is exerted on the muscles. The motor area must be aroused by association fibers whenever the movement of the hand is directed by the eye or ear, or by some internal thought. The visual area in the occipital lobe, the auditory area in the first temporal convolution, the "touch" or "somesthetic" area just behind the central fissure, and the olfactory area in the pyriform lobule, along with the motor area, cover only a small fraction of the cortex, and the remainder is by no means so certainly mapped out. In general, it appears that regions immediately adjoining a sensory area have functions closely related to that of this area, but "higher" or more intellectual. Thus the recognition of familiar objects by sight, reading, etc., depends on the occipital lobe; and the understanding of heard speech and the appreciation of music depends on a temporal region near to the auditory area. The region immediately behind the somesthetic area seems to be concerned with the perception of form, texture, size, weight, etc., by touch; and the region just in front of the motor area may have, besides its function of speech, control of writing and other similar coördinations. Even with these vaguer localizations added to what is clearly established, a large share of the cortex still remains uncharted.

The size or weight of the brain probably influences mental capacity, though the correlation is far from close. The brain develops earlier than any other organ except the sense organs; it is always forward in fœtal life, and at birth has fully a quarter of its adult weight; this increases to two thirds during the first year, and to nine tenths at four years; after which there is a slow increase to about the fifteenth year. The adult weight varies considerably in different individuals, with an average not far from 1400 grains (50 oz.); in women it is about 10 per cent less. (See GROWTH.) Studies of the cortex at different ages seem to show that the little fibers — dendrites and terminations of incoming axons — which constitute the working parts continue to grow till the fortieth year at least. In old age there is a shrinking in the weight of the brain. R. S. W.

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NERVOUSNESS. — See NEURASTHENIA.

NETHERLANDS, EDUCATION IN THE. — The Kingdom of the Netherlands is divided into eleven provinces; namely, North Brabant, Guelders, North and South Holland, Zealand, Utrecht, Friesland, Overyssel, Groningen, Drenthe, and Limburg. The names recall the independent dukedom, bishopric, and counties whose contests mark the early history of the country. The area of the kingdom is 12,648 square miles, and its population in 1910 was 5,945,429. It is a kingdom of large towns, having no less than thirty with populations above 20,000. The colonial possessions of the Netherlands, which have been a source of wealth, comprise an area of 783,000 square miles and a population of approximately 38,000,000.

The religious denominations have exercised great influence in educational matters. The royal family and the upper classes, generally, belong to the Reformed Church, which numbers above 2,588,000 adherents; other Protestant denominations comprise 746,000. The Roman Catholics number 2,052,781; Jews 106,402; Jansenists, 10,082. Complete religious liberty prevails, and each denomination receives an annual subvention from the treasury. The people of the Netherlands are nearly all natives by birth and ancestry, foreigners forming only 1 per cent of the total.

Historical Development. — The first school within the limits of what is now the Netherlands, so far as the records show, was established at Utrecht by Willebrord, missionary from England to the Frisians. He was ordained Bishop of Utrecht in 695 at the instance of Pepin, father of Charlemagne, who desired to found a bishopric in that part of Friesland which had been brought under the Frankish rule. Thus Utrecht became a center of enlightenment in the empire of Charles the Great. The monastery schools of Egmond, Nijmwegen, Middleburg, Zealand, and Adouwert were famous in the ninth century. The breaking up of the Empire after the death of Charles the Great was followed by invasions of the Northmen and the consequent rise to power of the great nobles who opposed their ravages, and of the towns to which the people fled for safety. It was in the eleventh century that the Count of Holland by his successful resistance to the Emperor, Otto II, gained overlordship in Nether-Lotharingia; and from William I, the Count of Holland who bore a notable part in the fourth crusade, the chief towns secured charters that guaranteed civic liberty and privileges to the burghers. Among the latter was the right to establish schools, and thus early in the thirteenth century, beside the Cathedral and monastery schools, appeared " public " or town schools. These were styled *School en Schrijfambacht, Schoolen en Kostern* (school and writing office; school and clerks' houses). The *schoolmijsters* (schoolmasters) were looked upon as professional men. They formed distinct guilds and fraternities and were highly respected by their fellow citizens. Public schools were divided into *groote en bijschoolen* (higher and lower schools). Latin was taught only in the higher schools, which had generally the largest number of pupils. One of them, the school of Zwolle, numbered 1000 pupils from the Netherlands and Germany. The Brethren of the Common Life (*q.v.*), whose first school was founded by Gerhard the Great of Deventer (1340–1384), did much for the promotion of education in different European countries. Thus the different classes of schools which maintain their distinctions under the present system of public instruction, namely, church schools, town or public schools, and schools belonging to private societies, all originated before the close of the fourteenth century.

In the century following, the provinces were controlled by the Dukes of Burgundy; but although their political life was stifled, the arts and the learning of the Renaissance flourished, especially in Flanders and Brabant. The States-General of the provinces, instituted by Philip of Burgundy, became, in time, the embodiment of their national will and purpose. From the last of the Burgundian rulers, the Duchess Mary, the cities secured the " Great Privilege " (1477) which affirmed their right to hold diets, reserved to the Estates a voice in the declaration of war and the imposition of taxes, established one high court of justice for Holland, Zealand, and Friesland, and made Dutch their official language. Thus the leading provinces entered upon the century of struggle against Charles V and Philip of Spain with a measure of internal union. This period was marked by a wonderful outburst of talent and learning. The fame of great scholars, Erasmus, Grotius, Barneveldt, to name only those who most profoundly affected human thought, is linked with that of William the Silent, founder of the Dutch Republic, and of his son Maurice, its military genius. The University of Leyden (*q.v.*), the bulwark of Protestant doctrine in the United Provinces, was founded by Wiliam the Silent in 1575 to commemorate its heroic defense against the Spanish besiegers. Ten years later (1585) a second university was created at Franeker, and in the seventeenth century three universities were added; namely, Utrecht, 1638; Groningen, 1644; and Herderwijk, 1648. Franeker and Herderwijk were closed in 1811.

The fall of the Dutch Republic is connected, indirectly at least, with the bitter controversy between the extreme Protestant sects, the Arminians and the Calvinists, which broke out in the University of Leyden early in the seventeenth century. The rivalries and contests of the different provinces completed the disaster, and the political life of the United Provinces became inextricably mingled with that of neighboring Powers. Nevertheless, a certain distinction was preserved to the Provinces by the achievements of their university teachers and by the refuge they afforded to men of science and learning exiled from their native lands.

Antecedents of the Present System of Primary Education. — The early zeal for education in this kingdom had little effect upon the common people; the first movement in their interests was begun by John Nieuvenhuysen, a Mennonite clergyman of Groningen, who founded in that city, in 1784, the Society of Public Good (*Maatschappij tot Nut van't Algemeen*), whose object was to promote elementary instruction — moral, social, and religious. The society established schools, published simple textbooks, and awakened great interest in the subject of popular education.

At this time the provinces were comprised in the Republic of Batavia (1795–1806), and the political spirit gave impetus to the efforts of the society. A special commissioner, the celebrated Van den Ende, was appointed to devise means for promoting the general instruction of the people. The outcome of his labors was the law of 1806, which forms the basis of the primary school system. Napoleon had already extended his conquests to Holland, and a few months after the promulgation of the law the Emperor made his brother Louis king over the province. Fortunately, however, Louis had no disposition to interfere with the educational movement. In 1810 he abdicated, and Napoleon then incorporated the provinces into the Empire and took measures for assimilating their educational system to that of the Imperial University. The report of Cuvier, one of the two commissioners appointed for this service, was so favorable to the system of primary education that it was continued with Van den Ende as its chief. After the fall of Napoleon and the establishment of the kingdom of the Netherlands, comprising Holland and Belgium, a decree was issued (March 6, 1815) which ordered that the school law of 1806 should be the basis for further regulations concerning public instruction. This early measure settled for the Netherlands the principle of public inspection of schools. It provided for the appointment of school inspectors who were to constitute in each province a permanent school board. The largest communes were required to form local school boards. No school could be established without the special permission of the provincial or communal authorities. The course of primary instruction comprised reading, writing, arithmetic, Dutch, French or other modern language, geography, and history. Schools were to be entirely independent of ecclesiastical influence. The schoolbooks were to be authorized by the school boards. Nobody was allowed to teach without passing the prescribed examinations.

The intervention of the State in education and the prohibition of religious teaching in the schools were vehemently opposed by the Roman Catholics, who formed the majority in the southern provinces (the present kingdom of Belgium). Their dissatisfaction grew from year to year, and finally gave rise to the revolution of 1830, which was followed by the permanent separation of Belgium from Holland. Before this event the school system had received two important extensions: In 1816, through the influence of M. Van den Ende, a normal school was established at Haarlem as an integral part of the system, and government recognition was extended to the normal school at Groningen, previously established by the Society of Public Good. Up to this time the teachers of Holland had been trained by serving an apprenticeship, from the age of fourteen to sixteen or eighteen, as assistants in the larger schools. During the same time they were given instruction for an hour every evening. This pupil-teacher system, which was subsequently introduced into England, never developed its worst features in Holland and in a restrained form is still employed there as a means of training. The pupil teachers form no part of the regular school staff.

The second measure of extension was the establishment of a higher class of primary schools, the *burgerscholen*, to meet the demand of the middle classes that the State should provide schools suited to their children. The law of 1806 had placed public schools and private schools on the same basis as regards inspection by the state and the qualification of teachers. Fees were charged in the public schools, but free provision was authorized for poor children, and thus the public schools became in practice charity schools, and the middle classes, who bore the greater part of the school tax, were forced to patronize the more expensive private schools. The higher order of public schools, established in response to the natural demand of the middle classes, included modern languages, French and English, as well as the sciences, in their curriculum. These burgher schools were condemned in Cuvier's Report as superficial and tending to draw students away from more solid branches. Time has shown that they anticipated, in a measure, the modern type of secondary school which is now found in every country.

Although the northern provinces were strongly Protestant, there was a Roman Catholic minority which showed the same opposition as the Belgians to the purely secular school system. The ultra-Protestants were in accord with them on this point and both together succeeded in restoring a measure of clerical influence to the schools. A royal decree of January 2, 1842, ordained that the religious faith of candidates for the teaching service should be taken into account, and authorized the examination of textbooks by the clergy before they should be adopted. Religious instruction was still excluded from the course of study, but the clergy were allowed the use of the schoolrooms for that purpose before or after the school hours.

The constitution of 1848, which replaced the earlier constitution of 1815 and is still in force, comprised the following clauses respecting education: Public instruction shall be an object of incessant care on the part of the government. Public instruction shall be regulated by law, with due deference to all religious creeds. The legal authorities shall provide for sufficient public elementary instruction throughout the kingdom. Instruction is free, and it is to be under the supervision of the secular authorities, whose functions shall be regulated by law. A report on the state of higher, middle class, and elementary instruction shall be submitted to the States-General (legislature) every year by the Crown (Art. 194).

The School Law (1857). — In accordance with the constitutional provisions, reports and projects of law for the regulation of elementary schools were submitted, but it was not until 1857 that a law dealing with the subject was successfully carried through the legislature. The underlying principles of the law as regards the scope and support of elementary schools and the qualification of teachers are as follows:

> Art. 1. Elementary instruction is divided into ordinary and more extended instruction. Ordinary instruction includes reading, writing, arithmetic, the Dutch language, history, the rudiments of natural

> philosophy, and singing. The more extended instruction is considered to include the rudiments of modern languages, of mathematics and agriculture, gymnastics, drawing, and needle work.
>
> Art. 2. Elementary instruction may be given either in schools or in the dwellings of the parents or guardians.
>
> Art. 3. Public schools are those established and maintained by the communes, the provinces, and the government, severally or in common; all others are private schools. Subsidies may be granted to private schools on the part of the communal, provincial, or state authorities. Schools thus assisted shall be open to all children, without distinction of religious creed. . . .
>
> Art. 6. Nobody is allowed to give elementary instruction who does not possess the proofs of capacity and morality. Foreigners must have a special permission from the government. . . .
>
> Art. 8. Any person giving elementary instruction without being qualified shall be prosecuted. . . .
>
> Art. 12. For the education of teachers there shall be at least two state training schools. The education of elementary school teachers shall be promoted by the government as much as possible.
>
> Art. 16. In every commune elementary instruction shall be given in a certain number of schools, sufficient for the number and requirements of the population, and the schools shall be open to all children without distinction of religious creed.

In addition to the essentials set forth in the articles above quoted, the law authorized the State to intervene if communes neglected its demands, determined the maximum number of pupils allowed for one teacher, the minimum salary for head teachers and for assistant teachers; and the mode of examining and certificating teachers, both men and women. The appointment of teachers was left to the communal authorities, but they were regarded as State officials and were entitled to pensions from the government under the following provision of the law:

> Art. 26. The right to a pension is acquired after an honorable discharge at the age of sixty-five, and after forty years' service. A pension may also be granted to those who after ten years' service have become invalid. Those who have not received an honorable discharge forfeit their right to a pension.

The expenses of elementary schools were to be borne by the communes; fees were authorized in all schools, but free tuition was required for indigent children. It was further provided that the State should give special aid to poor communities for the establishment of primary schools.

The system of school inspection provided by the earlier law of 1806 was continued and strengthened under the law of 1857. The general supervision of education throughout the kingdom was committed to the Minister of the Interior, who is represented by provincial and district inspectors in the exercise of the supervisory functions. The duties of inspectors, both State and local, were minutely prescribed in the law.

When the law of 1857 was pending in the legislature, the question of religious instruction was the chief subject of discussion. In the end the nonsectarian character of the schools was maintained; but it was expressly provided in the law that:

> The system of education shall be made conducive to the development of the intellectual capacities of the children and to their training in all Christian and social virtues. The teachers shall not teach anything inconsistent with the respect due to the religious opinions of others. Religious instruction is left to the several religious denominations. The schoolrooms shall be at their disposal for that purpose out of the regular school hours. [Art. 23.]

With a single exception the main provisions of the law of 1857 have proved satisfactory to all parties, and the subsequent laws of August 17, 1878, and December 8, 1889, have simply improved the system by strengthening the inspection service and raising both the standard of qualification and the minimum salaries for teachers.

The status of private schools, as determined by the law of 1857, has been the subject of bitter controversy and has been modified repeatedly as the opposite parties, Liberal and Conservative, have come into power. The law of 1878, enacted by the Liberals, ordered that every school receiving a subsidy from the State, however small, should be considered a public school and should be subject to the same regulations. The part of the State in the school expenses was fixed at 30 per cent for all schools classed as public. The Conservative party came into power in 1883, but it proved difficult for them to obtain subsidies for sectarian schools. In 1889 this was indirectly accomplished by including the proposals in a financial bill. This measure provided that the State appropriation, which had been fixed at 30 per cent of the total school expenditure by the law of 1878, should be proportioned to the number of pupils, alike in public and in private schools. Fees are required in all schools, but not to exceed the actual cost per pupil and are to be remitted in case of necessity. The additional appropriation for school buildings was fixed in every case at 25 per cent of the total cost. While State subsidies were thus sanctioned for private schools, the communes were prohibited from making appropriations to them. The immediate effect of this measure was to increase the number of parochial schools and reduce the attendance upon public schools.

The denominational difficulty having been settled by the law of 1889, support was secured for the compulsory principle which was introduced by a law of July 7, 1900, carried by the Liberals. Parents and guardians were required to secure the education of their children and the duties and powers of school attendance committees were accordingly extended.

Elementary Education. — *School administration and supervision.* — The State administration of schools is in charge of the Minister of the Interior; at the head of the inspection service are three general inspectors; and subordinate to them are twenty-five district inspectors; ninety-four inspectors of arrondissements, and from 200 to 300 communal committees. All these officials are appointed by the sovereign and receive their salaries from the State. The communal committees maintain close relation with the local school boards and local supervisors and report to the provincial inspectors. The latter make annual reports to the Minister of the Interior, and at his summons meet as an advisory council to deliberate upon the interests of elementary education.

The local administration of the schools rests upon the local civil authorities, communal burgomaster and council. The law requires that a school board shall be formed in every commune, but small communes may unite to form a board in common. The school board maintains constant supervision over the schools and reports to the communal council their condition and needs.

Statistics. — Primary instruction (*lager Onderwijs*) includes day schools for children of the obligatory age (seven to thirteen years); repetition or continuation schools; and evening schools. Elementary schools for defective children and infant schools are partly supported by public funds, but they do not come under the same regulations as the ordinary schools. The following statistics pertain to the latter only.

Day Schools	Number of Schools	Enrollment			Teachers		
		Boys	Girls	Total	Men	Women	Total
Public	5229	313,000	249,824	562,824	11,100	5201	16,301
Subsidized private	1889	150,347	190,971	341,318	4997	4775	9772
Non-subsidized private	127						
Total	7245	463,347	440,795	904,142	16,097	9976	26,073

The 2016 private schools in the above table were classified as — Charity and orphan schools: Protestant, 30; Roman Catholic, 31; Jewish, 2. Corporate schools: Protestant, 949; Roman Catholic, 867; Jewish, 2. Private schools: Protestant, 54; Roman Catholic, 10; other schools, 71.

The number of children between the ages of seven and thirteen enrolled in the schools January 15, 1910, was 727,854, which was 95 per cent of the total number of children of the ages named. The small number of children between seven and thirteen years of age not enrolled on the date mentioned were under the supervision of the school authorities. The total number of pupils having free instruction in 1909 was 277,792 or 30 per cent of the total enrollment. Boys and girls attend the same school and are instructed together.

The classification of the teachers and number in each class were as follows: —

PUBLIC SCHOOLS

Men		Women	
Head teachers	3195	Head teachers	63
Teachers	7905	Teachers	5138

PRIVATE SCHOOLS

Men		Women	
Head teachers	1148	Head teachers	535
Teachers	3517	Teachers	4240

The regulations call for one head teacher for every school; if the number of pupils is between 41 and 90 there must be a second teacher; if from 91 to 144 a third, and for every additional 55 pupils, an additional teacher. The minimum salary for head teachers ranges from 750 fl. ($301.50) to 950 fl. ($382); for teachers from 500 fl. ($201) to 700 fl. ($281.40). The salaries depend in a measure upon the number of pupils.

All teachers who have reached the age of sixty-five years, and those who are mentally or physically disabled, after ten years' service, are entitled to pensions. The pensions are paid quarterly, and amount to one sixtieth of the annual salary for each year of service, but must never exceed two thirds of the former salary.

The enrollment in the other schools included in the primary system, 1910, was as follows: —

Evening Schools	Pupils		
	Male	Female	Total
Public	2796	2132	4928
Private	1477	1055	2532
Total	4273	3187	7450

The pupils in the elementary evening schools are generally also attending day schools; hence the former are an adjunct to the latter.

Continuation Schools	Pupils		
	Male	Female	Total
Public	26,169	13,360	39,529
Private	5344	1374	6718
Total	31,513	14,733	46,247

The regulations require that primary schools shall be open without intermission the whole year, except on holidays. During class hours the master shall be present from the opening of school to closing; he must not engage in extraneous duties, nor absent himself except in cases of absolute necessity. Pupils must be enrolled, as far as possible, for fixed terms. An examination is held once a year at each school and qualified pupils are then promoted from the lower to the higher grades; if circumstance permit, rewards are given for diligence and merit. A deserving pupil, when leaving school after completion of the course of study, is presented with a certificate of honor. A code of regulations must be drawn up for each school, and this, whether written or printed, is displayed on the board, hung up in the classroom, and from time to time is read and explained by the master. School savings banks are maintained in nearly all schools.

Religious Instruction. — The lessons in religion are intrusted entirely to ministers and special teachers of theology. Regular teachers must refrain from teaching, doing, or permitting anything at variance with the respect due to the religious convictions of other sects. A teacher guilty of offense in this respect may be suspended for a term not exceeding one year, but in case of repetition of the offense he may be suspended for an indefinite period from the duties of a public-school teacher. The introduction of religious instruction into common schools is no departure from the principles of the law. It has been allowed on account of the difficulties experienced by parents who cannot obtain religious instruction for their children in other suitable places, but precautions are taken so that religious teaching shall not interfere with other lessons.

School Buildings. — The modern school buildings are commodious and well planned and the furnishings excellent. The sanitary conditions of the buildings are strictly regulated, and in a few cities the schools are supplied with bathing facilities. In fifty-eight communes medical inspection of schools is maintained.

Expenditure for Elementary Schools. — The total expenditure (current and capital) for elementary schools amounted in 1909 to 33,790,839 fl. ($13,583,917). Of this amount the State bore 62 per cent; the communes 28 per cent; and school fees, examination fees, etc., the remaining 10 per cent. The fees are small, often as low as four cents a week, and ranging up to twenty cents. The expenditure was equivalent to $14.18 per capita of the enrollment (957,839) in the elementary schools, *i.e.* day, continuation, and evening, and to $2.32 per capita of the population. There were also expended 39,124 fl. ($15,728) in the support of four public, and three private schools for the feeble-minded, and 20,908 fl. ($8,405) for a school for idiots. Of the latter amount only 6000 fl. were from public appropriations.

The provision of elementary instruction is completed by infant schools (*Bewaarscholen*) which are chiefly private in character. In 1910 they numbered 165 public, enrolling 30,073 children, and 1092 private with an enrollment of 102,970. This would raise the total number of children at school to nearly 18 per cent of the population.

Normal Schools. — The need of special preparation for teachers was recognized by the Society for Public Good and was impressed upon the authorities from the time public elementary schools were first established. The school law of 1857 provided that two State normal schools should be maintained, and subsequent laws, supplemented by general regulations, have greatly increased the provision for this work. In addition to the normal schools and normal classes maintained by the State, both schools and classes of this order are established by communes and by private bodies. These receive aid from the State if they comply with the official requirements. The importance of the service is recognized by the entrance examinations and by the final examination which entitles to a diploma. The standard of qualification for directors and teachers, and in the case of State normal schools appointments to these positions, must be confirmed by the sovereign.

The courses of study and training in a complete normal school cover four years. The subjects included are writing, arithmetic, composition, the Dutch language, general and national history, geography, natural science, singing, violin and piano, principles of the French, German, and English languages; mathematics, pencil drawing, gymnastics, agriculture, theory of teaching and pedagogy. Teachers must require all students to attend religious instruction, which is given at stated hours, and also their respective churches. Books and school material are furnished free of cost. Normal schools for young men are day schools; those for young women are generally boarding schools.

Statistics. — The salient particulars respecting these schools and classes as reported for 1910 are summarized in the tables on following page.

There were in addition to the above fifty-nine students (forty-five young men, fourteen young women) in training under the head teachers of schools. Of these seven men and one woman passed the diploma examination.

Special courses of training are maintained by the State, communes, and private associations for those intending to qualify as teachers of gymnastics, drawing, manual work, agriculture, etc. Candidates for appointment as principals of schools must pass a higher examination than that for ordinary teachers.

NORMAL SCHOOLS

Class	No. of Schools	Enrollment			Number of Students at Final Examination			Amount of State Appropriation (United States Currency)
		Men	Women	Total	Men	Women	Number passed	
State	7	503	83	586	115	20	119	$199,506
Communal . . .	3	59	225	284	16	57	59	17,534
Private:								
Protestant . .	12	368	371	739	68	30	47	29,000
Roman Catholic.	37	492	1531	2023	100	265	263	96,379
Others	5	14	2294	2308	4	80	59	18,013
Total	64	1436	4504	5940	303	452	547	$360,432

NORMAL COURSES

Class	No.	Enrollment			Number of Students at Final Examination			Amount of Appropriation (United States Currency)
		Men	Women	Total	Men	Women	Number passed	
State	86	1556	1858	3414	314	425	463	$208,024
Communal . . .	4	113	240	353	14	39	44	9006
Private	129	1515	1360	2875	230	219	267	48,162
Total	219	3184	3458	6642	558	683	774	$265,192

At Leyden there is a college for the training of kindergarten teachers, the only school of this class which is subsidized by the State. It receives from this source 3500 fl. ($1407) annually and from the city 2000 fl. ($800). In consideration of these funds, the college supplies teachers for the kindergarten schools of the city without charge. In addition to twenty-five resident students there is an average attendance of seventy day students. A noticeable feature of the training is the adaptation of the Froebelian methods and material to the conditions of child life in the kingdom.

Secondary Education. — Secondary education (*middelbaar Onderwijs*) is organized in accordance with a law of May 2, 1863, amended by laws of June 28, 1876, and April 25, 1879. Included under this head are: the burgher schools, higher burgher schools, agricultural schools, and industrial, trade, and technical schools. As in the case of primary schools, the secondary institutions may be of either public or private origin.

Supervision. — The Minister of the Interior, the supreme educational authority, exercises his control of this department through the agency of three general inspectors who are appointed upon his recommendation by the sovereign; one of these has special superintendence of the State agricultural schools. Local committees are appointed by the commercial councils with the approval of the minister, for the immediate supervision of public secondary schools. In the case of industrial or technical schools for girls, women are generally appointed on the boards. The supervision of the higher burgher schools is committed to their respective directors.

Teachers. — Only persons holding a diploma from a university or from a State examining board, and a testimonial of good moral standing, as required by law, are allowed to engage in secondary instruction. From this rule are exempted (1) persons who instruct children of one family only; (2) those who do not make teaching their profession but have obtained royal authority to teach without remuneration (members of religious orders). Directors and teachers of secondary instruction must receive authorization from the Minister of the Interior before they can be appointed to a position in any public or private institution, or for giving private lessons. Directors and teachers of higher burgher schools supported by the communes are appointed by the local council from a list of eligible candidates recommended by local authorities. Only male teachers are employed in the higher burgher schools. The teachers of secondary schools receive pensions upon practically the same conditions as those of primary schools.

Scope of the Burgher and Higher Burgher Schools. — The burgher schools, intended particularly for the children of tradesmen, mechanics, and agriculturists, are divided into day and evening schools. The course of study of the day schools extends through two years and embraces the following branches: Mathematics, physics, chemistry, theoretic and applied mechanics, natural history, elementary principles of technology and agriculture, geography, history, the Dutch language, political economy, drawing, and gymnastics. In each community of 10,000 inhabitants or more, one burgher school at least must be established by the communal authorities; but the burgher day schools are giving place to higher burgher schools and hence the lower grade is represented chiefly by evening schools.

The higher burgher schools are divided into schools with five years' course and schools with three years' course. The law requires that there shall not be less than twelve higher State burgher schools in operation in the country, and in at least five of these the course must be of five years' duration. The schools are fully equipped with laboratories, and with illustrative museums and are distinguished for the methods and thoroughness of the instruction in science and modern languages. The actual scope of the schools of this class is illustrated by the typical program given below.

PROGRAM OF THE STATE HIGHER BURGHER SCHOOLS AT UTRECHT

SUBJECTS	CLASSES AND HOURS PER WEEK[1]					
	I	II	III	IV	V	Totals
The Mother Tongue	3 4	3 3	2 2	2 2	2 2	12 13
French	4 4	3 3	3 3	2 2	2 2	14 14
German	3 4	3 4	3 3	2 2	2 2	13 15
English		4 4	4 4	2 2	2 2	12 12
History	3	3	3	2	2	13 15
Geography . . .	3	2 2	2	1	1	9 9
Communal, Prov. and National Institutions			1 0	1 1	1 1	3 2
Political economy .				1 2	1 1	2 3
Mathematics . . .	7 7	8 6	6 6	6 4	3 3	30 26
Mechanics . . .				2 2	2 2	4 4
Physics or Technology			2 2	2 3	4 4	8 9
Chemistry				4 3	4 4	8 7
Biology or Geology	2 1	2 1	1 2	1 2	1 2	7 8
Cosmography . .				1 1	1 1	2 2
Commercial Law .				 1	1 2	1 3
Bookkeeping . . .				1	1	2
Caligraphy . . .	1 1	 1				1 2
Freehand Drawing .	2 3	2 3	2 3	1 3	1 3	8 15
Geometrical Drawing			1	1	1	3
Gymnastics . . .	2 2	2 2	2 2	 2	 2	6 10
Totals	30 32	32 32	32 32	32 35	32 36	158 167

[1] The smaller figures in the columns are from other programs. They serve to illustrate the slight differences that exist.

Candidates for admission to the higher burgher schools must be at least twelve years of age, and must pass an entrance examination. Promotion from one class to a higher is made by examination, and at the termination of the course the students are examined by a government board: if successful, they receive a certificate which has great value for those seeking commercial or civil appointments.

For the latest year reported (1910) there were 81 higher burgher schools, of which 27 were State schools, 47 communal, and 7 private. The total number of pupils was 10,663, of whom 2347 were girls. For the final examination 1839 pupils were presented; the number who passed was 925, including 146 girls. The number of teachers was 1402; of these 395 had the Doctor's degree; 21 that of *candidaat* (corresponding to the French *licencé*), 869 had special diplomas. There were also 15 secondary schools for girls maintained by communes or private bodies, enrolling 1646 pupils. This makes a total of 3993 girls in the secondary grade of studies.

The salaries of directors of the higher burgher schools range from 2750 fl. to 4000 fl. ($904.80 to $1608); salaries of teachers from 1000 fl. ($402) to 3050 fl. ($1225). The total expenditure for the schools of this class in 1909 was 1,922,770 fl. ($772,954). Of this amount 12.6 per cent was covered by State appropriation; the balance, by communal appropriations and fees.

The diploma of the higher burgher school is required as a preliminary qualification for engineers, architects, and technologists who aspire to enter the State service. The diploma admits to the polytechnic school at Delft, to the special course of the Indian service schools at Delft and Leyden, to the military school at Haarlem, and to the artillery course at Delft.

Industrial and Technical Schools. — The higher burgher schools are the only institutions comprised in the division of *middlebaar Onderwijs* which are intended for general education of the secondary type. The term, in fact, pertains to administrative rather than to scholastic relations and the great proportion of schools belonging to this department are industrial or technical in character. Hence they may be considered as forming part of the system of technical instruction. Many of these schools are burgher evening schools, others belong to special classes of technical schools. As regards control they may be public, *i.e.* established and maintained by communal authorities, or private. In any case they may receive State subsidies. The scope and variety of the schools of industrial arts are indicated by the following particulars of those maintained in two towns selected from a list of sixty-four institutions.

COMMUNE	NAME OF SCHOOL (ENGLISH EQUIVALENT)	NO. OF TEACHERS	NO. OF PUPILS
AMSTERDAM	(1) Evening drawing school for manual workers . .	27	554
	(2) Industrial school of the society of workers . .	13	166
	(3) School of drawing for the artistic industries .	13	350
	(4) Seminary for mechanics	21	175
	(5) Industrial school for young women . . .	24	282
HERTOGENBOSCH	(1) Royal School for useful and fine arts	11	219

In all the schools of this class, drawing occupies the chief place; mathematics and the mother tongue come next in importance; other branches respond to local needs.

Of the more highly specialized schools, the Trade School (*Ambachtsschool*) at the Hague ('s Gravenhage) may be taken as a typical example. It was established in 1873 by an *Association for the "Advancement of the Building Trades."* It receives municipal support and is amply equipped for the accommodation and instruction of 300 boys. To the general subjects mentioned above, the Trades School adds special courses in wood and metal work and construction. The program covers three full years.

The specialized schools include eleven schools of navigation and ten for training fishermen. Commercial education is provided for by courses in the higher burgher schools and by special classes maintained by private societies, chambers of commerce, etc.

The schools of household industry for girls form one of the most important groups in this department. They number thirty, established by communes or by private associations and all but four subsidized by the State. Nineteen of the number are day schools; the remainder, generally, have both day and evening sessions. The duration of the course of training varies from one to three years; the range of fees is from 25 francs to 650 francs ($5 to $130) a year.

Included in this same administrative department are the communal institutions for the deaf-mute at Rotterdam and Groningen and one for the blind at Amsterdam, all subsidized by the State. The children committed to their charge receive their living and tuition gratuitously, excepting those whose parents are able to meet the expenses. " St. Michiel's Gestel " is an institution for the deaf-mute maintained by the Catholic Church, but receiving state appropriations.

The department of *middelbaar Onderwijs* includes also several schools of a professional character which do not, however, require the same order of preliminary training as the university faculties. Among these schools are: (1) The State Academy of Applied Arts at Rotterdam; (2) the state schools for the training of drawing teachers at Amsterdam and the Hague; (3) state training schools for midwives at Amsterdam and Rotterdam; (4) military and naval schools.

Agricultural Education. — The system of agricultural education in the Netherlands, which has attracted wide attention, forms a subdivision of this same department (*middelbaar Onderwijs*), although its transfer to the department of agriculture has been under consideration. In all matters relating to agricultural education the government is advised and assisted by the general Inspector of Secondary Education in charge of agricultural schools. The system includes: (1) state establishments; (2) courses of instruction, theoretic and practical, maintained by the Provincial Agricultural and Horticultural societies, with the assistance of state subsidies. The state establishments are: (1) the Agricultural College at Wageningen; (2) the Agricultural and Horticultural winter schools; (3) the Veterinary College at Utrecht; (4) Instructors of Agriculture and Horticulture appointed by the government in the various provinces, to give instruction in their respective subjects.

The well known State Agricultural College at Wageningen consists of four sections: the Agricultural School, the Horticultural School, the High School, the High School for Agriculture and Forestry. An important feature of the institution is the thorough course in colonial agriculture intended for students who desire to go out as assistants or managers of sugar, coffee, tea, and other plantations in the colonies (Java), and who require, in addition, an elementary knowledge of colonial agriculture, laws, and customs. The college is controlled by a board consisting of the directors of the four sections. One member of the board is appointed by the Government as president with the title of *Hoofd-directeur* (Chief Director). He acts as the executive officer of the college. There are forty professors and teachers and an average of 250 pupils. The annual expenses of the college are about 1,100,000 fl. ($442,200).

Higher Education. — The present system of higher education (*hooger Onderwijs*) is based upon the law of April 28, 1876, amended and modified by laws of May 7, 1878; June 28, 1881; June 15, 1883; and July 23, 1885. The institutions included in this department are either of public or private origin. The former are established and maintained by communes and the State, separately and conjointly; the latter may be subsidized from public funds. In accordance with the law of 1876, the public institutions are the gymnasia and Latin schools, the three state universities, and the communal university of Amsterdam; the denominational " seminaria " and other private institutions answer to the universities, but only the latter can confer academic degrees. The fundamental law established the principle of liberty in higher education; but all persons engaged in this service are subject to supervision by the educational authority. Foreigners must obtain authorization from the sovereign before they can be employed as teachers of the higher branches, in either public or private institutions.

The Gymnasia. — The classification of the gymnasia under the head of higher education is a peculiarity of the Netherlands system which follows historic precedents. The gymnasia have replaced in the modern system the classical schools which were preparatory to the universities. The higher burgher schools, classed as secondary, start at the same level as the gymnasia and admit pupils at the same age, *i.e.* twelve years. To a certain extent the courses of the two classes of schools are parallel, as is shown by the programs. But the graduates of the higher burgher schools cannot enter the university faculties without at least a year's preparation in Latin and Greek. Authorities in Holland are divided in their opinion as to the wisdom of maintaining this distinction of degree between the burgher schools and the gymnasia, but so far the advocates of Latin and Greek as affording a higher order of intellectual discipline than the modern studies have prevailed.

The law requires that every community of over 20,000 inhabitants shall equip and maintain a gymnasium; other communities may take the same action. The supervision of each gymnasium devolves upon a communal council, styled College of Curators. The head of a gymnasium, the Rector, and also the Co-Rector must possess the doctor's degree in classical philology; the professors must have either a university diploma or certificate from the State Examining Board. Appointments to these positions are made by the communal authorities; if the institution receives a state subsidy, the choice must be approved by the Minister of the Interior. The professors are present simply for their class instruction, and their salaries are regulated by the number of hours' instruction which they must give. The government inspectors report annually to the Minister of the Interior as to the condition of the public institutions of this order. Private gymnasia exist, also under authorization from the Minister, to whom they must send an annual report. The public gymnasia follow an official program, which is given below. The private institutions are independent in this respect.

CURRICULUM OF THE GYMNASIA

SUBJECTS	CLASSES AND HOURS PER WEEK										TOTALS	
	I	II	III	IV	V			VI				
					Hum.[2]	All	Real[3]	Hum.[2]	All	Real[3]	Hum.	Real
Greek	8 5 [1]	6	6	7	2	4		3	4		32	27
Latin	8	6	6	6	3	5		4	4		42	35
Dutch	3	2	2	2		2			1		12	12
French	4	2	2	2		1			1		12	12
German		0[1] 3	2	2		2			1		9	9
English			3	3		2			1		9	9
History	4	3	3	3	1	1		1	2		18	16
Geography	3	2	1						1		7	7
Mathematics	4	3	3	3		2	3		2	3	17	23
Physics						2	1		2	1	4	6
Chemistry							1			1		2
Natural History	2	2					2			2	4	8
Total	28	28	28	28	27	28	28	27		26	166	166

[1] Eight hours per week for part of year; five hours for remainder. Similarly as regards 0 and 3 in Class II.
[2] Extra for humanists.
[3] Extra for "real" students.

Statistics. — There is a public gymnasium in each of the thirty principal cities of the kingdom and thirty-one additional private gymnasia. The former had in 1910 a total of 2250 students (1647 young men, 603 young women). The private gymnasia had in the same year 2048 students. Altogether there were 4298 students in this stage of higher education. The teaching force of the public institutions numbered 456 professors; of these 240 had the doctor's degree; fifty-five the title of docent; the remainder had certificates from state examining boards. The expenditure for the public gymnasia in 1910 amounted to 907,594.54 fl. ($364,853) to which the State contributed 262,319 fl., or 28 per cent.

The Universities. — There are three state universities, Leyden, Utrecht, and Groningen, comprising each the five faculties of theology, law, medicine, science, letters, and philosophy. The internal administration of each university is in charge of a college of curators, the members of which are commissioned by the sovereign. The university senate, which determines the scholastic arrangements, consists of members representing the several faculties, the choice being in each case sanctioned by the Minister of the Interior. The curators through their secretaries make detailed reports of the affairs of their respective institutions to the Minister of the Interior and submit each year an estimate of expenditures for the coming year. The Minister, in turn, presents the estimate to the legislature and disburses the appropriation allowed.

Professors in the state universities receive their appointment from the crown and may be suspended or dismissed by the Minister for incompetency or misdemeanors. On reaching the age of seventy, university professors are pensioned. The amount of pension is determined by the number of years of service, but it may not exceed the sum of $1206 per annum. Professors in the higher institutions belonging to the Catholic Church are also pensioned by the government.

STATISTICS OF THE UNIVERSITIES, 1910–1911

University	No. of Students	Number of Professors and Teachers	Expenditure	
			Fl.	U.S. Equivalents
State				
Leyden	1195	76	1,119,260	$482,102
Utrecht	1082	69	1,061,774	426,833
Groningen	551	51	817,519	328,643
Communal				
Amsterdam	1139	109	632,500	254,265
Total	3967	299	3,711,053	$1,491,843

The faculty of medicine has the largest registration in all the universities. Leyden is particularly distinguished for law, which claims the greatest number of students after medicine. Utrecht leads in theology. The Doctor's diploma, which is conferred by the universities, carries mention of the Faculty in which the student has completed his studies.

The universities all have extensive libraries and are well equipped with laboratories and museums. Clinical facilities are afforded the students of medicine, in hospitals connected with the universities.

The provision for higher education is completed by a private university at Amsterdam, and about twenty-six denominational institutions in various places, some of which receive subsidies from the State. They are designated as seminaries, colleges, Latin schools, training schools. Their aim is generally the training of young men to serve as ministers in their respective churches and as teachers of higher branches.

The Polytechnic School. — The Polytechnic School at Delft affords the highest order of technical training for engineers, architects, and architectural engineers. The number of students in 1910 was 1235, including 705 not following a complete course. The faculty numbered fifty-four professors; there were also six private docents and eight assistant professors. The expenditure was 680,803 fl. ($273,683). Every student of the polytechnic school pays $80 in advance for the annual course, which entitles him to all the advantages of the school. Those taking elective studies pay only for the subjects chosen, at the rate of $4 per annum for each study, with one recitation per week. For four or more recitations per week the fee is $16 per annum for each study. The students who have taken the course of the polytechnic school at Delft, and wish to go to the East Indies as government officials, prepare themselves for such positions by taking a two or three years' course in the school at Leyden for the training of officials in the East Indian service. Here they are taught the Java, Malay, and Boegine languages.

The instruction is under the general supervision of a college of curators, and the head master and teachers are appointed by the sovereign. The yearly program arranged by them must be submitted to the Minister of the Interior for his approval. The total expenditure for higher education in 1909 was 5,773,138.41 fl. ($2,320,802) derived as follows: —

	Fl.	Per Cent
State appropriation . . .	4,634,867.23	80.2
Province of North Holland	10,000.00	0.3
Communes	1,128,271.18	19.5
	5,773,138.41	

Summary. — The system of education in the Netherlands is marked throughout by the harmonious action of somewhat incongruous elements combined in a rather loose organization. The effective working of the system is due: first, to the inspection service; second, to the high standard of the teaching force; third, to the examination tests which meet the student at every important stage of his progress. It is noticeable further that while the highest order of intellectual discipline is fostered, provision is made for training every aptitude which finds its exercise in the varied industries of modern life. A. T. S. & C. H. P.

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NETHERLANDS, COLONIES OF, EDUCATION IN THE. — With the exception of the British Empire of India, the colonial possessions of the Dutch in Malaysia form the greatest empire of dependent people in the world. This territory includes the major part of the two largest islands of the world, New Guinea and Borneo; the richest and most populous island, Java; and the famed and long-coveted "Spice Islands," the Moluccas. Four fifths of the entire Malay race inhabit these islands, and nearly three fourths of the entire number, or about 30,000,000, are on the island of Java, which is the seat of the Dutch administration. The smaller islands of the group are inhabited by black people. Arab settlements are found in important ports like Batavia, Samarang, Surabaya, and Makassar, or journeying as traders and proselyters. Through their religious faith, which they have communicated to the Malay race, they possess great influence over the entire population. The other important foreign element is the Chinese, who are settling in nearly all the towns of the archipelago, although restricted as to dwelling and place of business to certain quarters. They number about half a million, the majority of them residents of Java.

Until near the middle of the last century the education of the natives received little attention. But in 1848 after the Dutch States-General obtained control of the government of the colonies, an appropriation of 25,000 fl. was made for native education. In 1854, the *Regeerings Reglement* provided that the governor-general should establish schools for the native population, but the provision was vague and practically inoperative for many years. At last interest awoke; the Department of Education, Worship, and Industries was created in 1868, and about 1872 the organization of schools for the native people began in earnest. In 1884 a reaction set in and progress ceased. But a reorganization of the education work was finally seen to be necessary, and in 1892 and 1893 there was sanctioned and put into effect a scheme of native instruction which had been proposed some years earlier by the director of education, Mr. W. P. Groeneveldt. Under this scheme two kinds of public instruction are maintained, one patterned upon the European system (*Europeesch Onderwijs*), the other native education (*Onderwijs voor Inlanders*).

European Schools. — Schools for the European population have long been provided. Under the new conditions they are more closely organized and are assured of government supervision and support. Their characteristic features are similar to those of the schools in the mother country. The public lower schools, in 1909, numbered 190 with 732 European teachers and 21,714 pupils. Of these 9120 were boys, and 7371 girls of European birth; 3693 were natives, 3190 being male; 1530 were Asiatic foreigners, largely Chinese, 1101 being male. There are also 40 private European lower schools aided by the government, with over 5000 pupils, mostly girls.

The rapid increase of native attendance in the European schools was one cause of the establishment of the native schools. Compared to the number of European or mixed European people for whom the former schools are created, the system must be regarded as exceedingly liberal. This population was reckoned a few years ago at 80,000, and its children were in public or private primary schools to the number of over 20,000, or more than 25 per cent of the corresponding population.

For secondary education of the European type, there are several schools, of which the most important is the Gymnasium William III at Batavia. This institution has a five years' course corresponding to that of the higher burgher schools in Holland, and in addition a special course preparing students for the civil service. The studies pertain to the languages, the geography, and ethnology of the Indies. Similar schools are founded at Surabaya and Samarang. The Queen Wilhelmina School is the name applied to a group of schools at Batavia giving secondary instruction of a technical character.

Native Schools. — The schools for Europeans are all open to natives, but they reach only a very small proportion of them. The scheme that was put into operation in 1892–1893 provided for a system of lower primary schools for natives only. These schools are of two classes: first and second. The latter offer a four years' course only in the common branches, instruction being given in the native dialect and Malay. The first-class lower school offers a six years' course and, besides instruction in the native dialect and Malay, gives three years' instruction in Dutch. The introduction of Dutch marks the return to a policy abandoned twenty years ago. The language has proved indispensable as a basis for higher training, especially on administrative, technical, and professional lines, as well as for the intellectual development of the native. The authorities are convinced that the diffusion of the Dutch language among the peoples of their great Empire will be a political factor of the highest value; hence they have deliberately given up the former policy of discouraging its use in native education.

These graded schools will be located chiefly in the more populous places; but in 1906 a plan was adopted for establishing rural schools, *dessa* schools, within reach of every hamlet; for it is admitted that until the rural population is taught to read, write, and keep accounts the mass will remain incapable of further advance. In accordance with this plan, schools are being rapidly established in all the islands. It is estimated that Java alone will require 30,000 *dessa* schools. This development will call for an increased number of teachers from Holland and renewed efforts for the training of native teachers.

Normal Schools. — In the reaction of 1884 the number of normal schools for natives was reduced to four, situated respectively at Bandoeng and Probolinggo in Java, Fort de Kock in Sumatra, and at Amboina; a fifth school was added at Djokjakarta in 1897 and a sixth at Oenarang in the residency of Samarang in 1905. In these schools the government furnishes free instruction to students and provides them with furnished rooms and an allowance of 10 fl. ($4.20) a month for food and clothing. The course of study in the normal schools is arranged for five years and comprises the Dutch language, Malay, and one other native tongue, arithmetic, geometry, land measuring and surveying, including leveling and waterways; geography, history of Netherlands-India, natural sciences, including elementary physics and meteorology; plant and animal life, writing in Arabic, in Javanese, or other native characters, and in Roman letters, music, and very thorough work in drawing, which is pursued for five years. In the fourth and fifth years instruction is given in pedagogy and school administration; the sixth and last year is devoted to general review and to practice teaching in a well-organized training school.

Schools for Native Officials. — Another important feature of the system is the establishment of training schools for native officials. The idea is not new, as schools of this class were created as early as 1878; but the entire character of the training has been changed, and to the four older schools, three new schools have been added since 1909. In several of the schools a normal department for training native teachers is included, and in the higher section the student pursues jurisprudence, public and administrative law of the Indies, political economy, land surveying, waterways, line and map drawing. In 1909 a professional school intended to prepare native magistrates was opened at Batavia. It forms with the medical school at Batavia, which was reorganized in 1902, the nucleus of a native university.

Chinese Schools. — Special mention should be made of the Dutch-Chinese schools intended for the children of the extensive Chinese population by whom the practical value of education is fully realized as shown by their attendance upon the European schools. Such schools were organized in 1908 at Batavia, Samarang, Surabaya, and Makassar. In 1909 seven more were opened, at Menado (Celebes), Bandjermassin (Borneo), Singaraja (Bali), Padang (Sumatra), and at Malang, Surakarta, and Bandoeng, Java. These schools have the same organization and offer the same course as European lower schools.

Cost of Education. — The government expenditure for public schools in 1907 amounted to 2,678,353 fl. ($502,252) The estimated cost for 1910 was 3,570,200 fl. ($2,158,820), including subsidies to private schools. These sums do not cover the cost of construction of new buildings, which, except for *dessa* schools, is borne by the State, and will amount in the next few years to large sums annually.

A. T. S.

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NEUCHÂTEL, UNIVERSITY OF, SWITZERLAND. — Although the present university was only created in 1909, the municipal and cantonal authorities have for the last two centuries striven to provide an institution of higher learning. In 1659 a proposal was made to the town council to appoint instructors and professors to teach philosophy. In 1712 the council ordered four ministers to draw up a plan for the appointment of a professor of philosophy, and in 1731 Louis Bourget was appointed to this position. In 1737 a professor of literature was appointed. But there was as yet no definite institution. It was not until 1830 that serious efforts began to be made to establish an academy, inspired by the general movement to provide higher education in Switzerland. In 1838 it was proposed to found an academy to give courses preparatory to the universities and professional studies. In 1839 public lecture courses were given, and in 1841 the academy was established with seventeen professors in arts, science, and law, and additional chairs were provided in the next few years. Only the faculties of arts and science granted degrees. It is interesting to note that both Agassiz and Guyot (*qq.v.*) were members of the teaching staff at this time.

The academy, however, was closed in 1848, only to be reëstablished on a more permanent footing in 1866, with the same three faculties, and gymnasiums or secondary school departments. The latter were organized into a cantonal gymnasium in 1872. In 1874 a faculty of theology was established, and 1883–1884 the faculty of law was empowered to grant degrees. In 1878 a course in French for foreigners was organized and later was converted into the *Séminairè de Français moderne pour Étrangers* (1892). In 1886 a building was erected for the academy, and in 1887 the first laboratories were added. But in spite of the rapid progress, the academy did not yet possess the same rank as other Swiss universities and still continued to give what properly belonged to the secondary schools. In 1894 a reorganization took place, and this deficiency was remedied to meet the standards generally prevailing in the country. In 1896 the laboratories were increased in number, and various collections were acquired. In 1909 the academy was raised to the rank of the university, with faculties of letters, science, theology, and law. One year's work is given for medical students. The *Séminaire* for foreign students has grown in popularity and attracts many foreigners. A *Diplôme pour l'Enseignement du Français moderne à l'Étranger* is given after a course of two semesters in the *Séminaire*. The enrollment in the summer semester of 1911 was 226 matriculated students and 76 auditors.

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NEURASTHENIA. — According to Beard, the first to describe the disease, "neurasthenia is a chronic functional disease of the nervous system the basis of which is impoverishment of nervous tissues in excess of repair," and, according to Ziemmsen, "it is a functional weakness of the nervous system varying from the slightest degree in certain localities to an entire loss of strength in the whole nervous system." No disease is as prevalent as neurasthenia, if with it we group its mental counterpart which is discussed under the title psychasthenia (*q.v.*). Although neurasthenia has been considered a typical American disease, it is not confined to those Americans who lead fast, energetic lives, but is found at all ages and among all civilized races.

Neurasthenia is a most insidious affection, since the symptoms resemble so much those which are to be found in normal children and adults as the result of ordinary work and fatigue. In fact, the symptoms in neurasthenia are principally those corresponding with fatigue and exhaustion. The individual who suffers from neurasthenia has these symptoms, extending, however, over comparatively long periods, and it is because of the long-continued character of the symptoms that we consider them a disease.

The symptoms in neurasthenia are both subjective and objective, but it is upon the subjective ones that the diagnostician must depend for his chief information. The individual feels worried; he has a feeling of hopelessness or sometimes a simple and vague depression similar to that which is found in melancholia. Associated with these we find obsessions or fixed ideas. In connection with these subjective feelings we find an apparent lack of strength; there is less movement on the part of the individual and when movements are produced, they soon lead to weariness or fatigue; usually the appetite fails and there is a loss in weight. As an evidence of the lack of control of the nervous system, we find variations in the vasomotor system. The heart also is affected; we find cardiac palpitations and quickenings, sometimes a weakening of the force. In another field we find hyperesthesia, which is evidenced by restlessness or nervousness; the individuals are irritated by the slightest stimulation; parathesias are frequent (feelings of itching and of burning, *e.g.* animals in abdomen, etc.). Headache is common, sometimes localized above the eyes, but most often at the occiput and extending down the spine along its entire length. We find on the motor side, a slowing in movement (retardation); the individual does not want to move; he takes a long time to start a particular movement, and when the movement is performed it is usually slow and of little force.

In the disease, fatigue is commonly noticed in the morning after sleep (morning tiredness). This is replaced after some hours with the ordinary feelings, so that the individual in the morning is less capable of carrying on work than in the latter portion of the day. Neurasthenia is especially common in women and children. At times when the demands upon the nervous system and the body are greatest, it is most likely to occur, *e.g.* at puberty. Although neurasthenia may arise in an otherwise healthy individual, it is usually to be found in individuals of nervous type, and in those upon whom hereditary influences are acting. The treatment of the disease is mainly that of rest.

Since many of these conditions start as the result of excessive stimulation and of excessive work during periods of strain, it will be understood that the condition is to be found commonly associated with the periods of growth and of great functional activity. At such times children should be protected as far as possible from excessive fatigue, and they should be permitted to carry on a minimum of school work; lessons should be short and easy and long periods of rest should be taken between them. Such children must be kept out of doors as much as possible, and should be compelled to take a midday rest and go to bed early. The time lost in this way is really a gain because it prevents a general breakdown which may require a complete cessation of all activity for six months or a year. The permitting of such children to try for prizes in school is hygienically criminal. Children who show symptoms of fatigue beyond the normal from the work of the school day should be referred to the school physician for a careful examination. Their condition should be reported to the parents with a recommendation regarding the stopping of the school work.

The neurasthenic state is commonly found as a prodrome to many mental diseases. Whenever the symptoms are found they should be considered with suspicion, because if they are not neurasthenic they are generally the symptoms of disease of a grave character. It should be noted that the feeling of early weariness and of fatigue with depression are commonly early stages in a number of diseases, such as measles, scarlet fever, etc., and the reference by the teacher of such a pupil to the school physician will sometimes help to prevent an epidemic in her class or in the school.

S. I. F.

NEUROLOGY. — See MEDICAL EDUCATION; PHYSIOLOGY.

NEURONE. — See NERVOUS SYSTEM.

NEUROSIS. — A term used to designate a nervous state. In combination, as psychoneurosis, to indicate a disease that has nervous, in contradiction to mental, symptoms in addition to the mental. Among the best known psycho-neuroses may be mentioned: epilepsy, (*q.v.*), hysteria (*q.v.*), and neurasthenia (*q.v.*)

S. I. F.

NEVADA, STATE OF. — Organized as a territory in 1861, and admitted to the Union as the 36th state in 1864. It is located in the Western Mountain Division, and has a land area of 109,821 square miles. In size it is about the same as the combined areas of the states of New York, Pennsylvania, New Jersey, and Maryland. For school administration the state is divided into 5 supervisory districts, and these in turn into 15 counties and about 325 school districts. In 1910 Nevada had a total population of 81,875, a school census (5–18 years) of 12,319, and a density of population of 0.7 per square mile. Though exceeded in size by but five states, Nevada has the smallest population and the smallest number of people to the square mile of any state in the Union.

Educational History. — The first territorial legislature in 1861 enacted as the first school law one which contained all the provisions necessary for the beginning of a state system of schools, and laid down the fundamental outlines of the subsequent school system of the state. To a Territorial Superintendent of Public Instruction, to be elected in 1862, was given the general oversight of the educational system of the state. To assist him, an *ex officio* State Board of Education, composed of the Territorial Superintendent, Territorial Auditor, and Territorial Treasurer, was created. For each county a county superintendent of common schools was to be elected for two-year terms, to have general oversight of the schools of his county, and the usual administrative duties. He was to divide his county into school districts, for each of which three trustees were to be elected, to have general supervision of the schools of the district. They were to provide for the school, elect the teacher, take a school census, levy taxes, and visit and inspect the schools. A permanent state school fund, to be created from the sale of lands, was provided for, and fines were to be added to it. The system as thus early outlined has persisted in its main outlines until within the last ten years.

By the constitution of 1864, under which the territory was admitted to the Union, and which, with minor amendments, still stands, rather full provision was made for the future state school system. The legislature was enjoined " to promote intellectual, literary, scientific, mining, mechanical, agricultural, and moral improvement" and a uniform system of schools, with a term of six months as a minimum, was to be established in each school district of the state. A State Superintendent of Public Instruction was ordered to be elected; all school lands were declared to be an inviolable trust; sectarian aid was forbidden; a state university was to be established, and a state tax provided for it; and power to establish a normal school was granted. The first school law under the new constitution, enacted in 1865, carried these provisions into effect, and in addition created a State Board of Education, county superintendents for the counties, and county boards of examination, composed of the county superintendent and two persons appointed by him. The revisions of the school laws made in 1873, 1877, and 1879, made only minor changes, retaining the essential outlines of the system. The law of 1873 contained the first compulsory school law for the state. The State Teachers' Association was first organized in 1880.

The University of Nevada was created in 1873, to be located at Elko. A state normal school was also created in 1887, to be a department of the State University.

As a state, Nevada has had a slow and irregular growth, and this has influenced the development of the state's educational system. At the time of the admission of the state, the school census, 6–18 years of age, was but 2,601. This increased slowly up to 1880, when the school census reached 10,592. After this a slow decrease in school census set in, owing to the decline in importance of the mining interests. After 1890 this decrease became a little more marked, the lowest figure, 8,996, being reached in 1898. Since 1903, through the opening of new mines of importance, the building of a number of new railway lines, and the development of agriculture through irrigation, the state has begun to increase in population more rapidly than at any time in its previous history. The number of school census children is now close to 12,500.

It is only since the recent increase in population and business that any real interest in educational legislation and development has been shown. During the period of decline and stagnation little was done, and some backward steps were taken. In 1887 the county superintendency and the county boards of examination were abolished, and the county district attorney was made *ex officio* county superintendent, but without salary. This virtually abolished all supervision. For the twenty-five years between 1880 and 1905, one State Superintendent after another recommended new legislation and asked for a new school code in vain. Minor changes were made from time to time, mostly relating to teachers' certificates, but no legislation of a fundamental or markedly progressive order was obtainable. It is practically only since 1907 that any marked progress has been made. State Teachers' Institutes were created in 1893, and state aid was granted to them. In 1895 a county high school law was enacted, but it was more than ten years before more than one school was established under this law. In 1903 the Virginia City School of Mines at Virginia City was created by the State, and placed under the control of the State Board of Education. In 1905 a public school library law was enacted.

In 1907 and 1909 important educational legislation was enacted and in 1911 a new School Code. These are embodied in the present system.

Present School System. — At the head of the system is an *ex officio* State Board of Education, consisting of the Governor, the President of the State University, and an elected State Superintendent of Public Instruction. The State Board of Education must meet at least twice yearly; prescribes the course of study to be followed in all the schools of the state; appoints all Deputy State Superintendents, on recommendation of the State Superintendent, and may similarly remove the same for cause; prepares all questions for the examination of teachers, and grants all teachers' certificates; determines the amount of money to be apportioned to the school district library funds; approves all apportionments to districts from the State Emergency School Fund; appoints trustees for all free county libraries established; and acts as a Board of Trustees for the State School of Mines at Virginia City. The State Board also acts *ex officio* as a State Normal School Training Board, for all high schools offering normal training, and determines the qualifications for admission, establishes the course of study, grants the diplomas of graduation from the normal course, and makes rules and regulations for the management of such schools. Together with four others, principals or superintendents of schools, to be appointed by the Governor, the State Board unites to form a State Textbook Commission, which adopts all textbooks for the state for four-year periods, and contracts with publishers for the same.

The State Superintendent of Public Instruction is elected for four-year terms, and receives a salary of $2,000 a year and an allowance of $400 for traveling expenses. On his recommendation the State Board appoints a State Deputy Superintendent for each of the five supervisory districts into which the state is divided. They receive the same salary, a traveling allowance of from $800 to $1,200, and from $400 to $600 for office expenses. The State Superintendent is required to visit each county at least once each year; to prescribe forms; to make minor rules and regulations; to apportion the school funds to the districts; to approve all schoolhouse plans; to recommend the consolidation or enlargement of school districts; to make arrangements with California or Utah for the schooling, at state expense, of all deaf, dumb, or blind children in the state. He also must hold a State Teachers' Institute biennially, for which $200 is appropriated by the state, and a district institute in each supervisory district in alternate years, for which $150 is appropriated. He may also hold county institutes if the county commissioners approve, and will pay for the same. He must make a biennial report to the Governor, and edit and print the school laws.

Each deputy superintendent must be a resident of his district; must hold a high school teacher's certificate; must have had forty-five months' experience (nine in Nevada); and must devote his entire time to school supervision in Nevada. He must visit each school in his district at least twice yearly; examine all records; advise teachers; hold teachers' meetings; confer with trustees; examine all records and accounts of the district; and may suspend teachers or certificates for cause. He also acts as a deputy examiner at teachers' examinations, as a member of the State Board of Educational Examiners, and assists the State Board in preparing the state course of study for the schools. He attends meetings of the State Board, to advise as to affairs in his district, and acts for the State Superintendent in educational matters as directed.

There are no county school officials, except county boards of education in such counties as have voted to establish county high schools. Where this has been done, a county board of three is elected to manage the high school, under the supervision and direction of the State Superintendent and the State Board of Education, and their powers are about the same as those of district boards of school trustees. For each school district a board of three district school trustees is elected, one for two years and one for four years, at each biennial election. To these boards are given the power to employ teachers and to fix their salaries; to visit the schools; to enforce the course of study, and the adopted textbooks; to provide supplies and apparatus; to suspend and expel pupils; to enforce discipline and sanitary regulations; to provide for the schooling of indigents; to appoint a school census marshal each year; and to levy an annual district tax, up to 25 cents, for maintenance. If the district has 300 children, a kindergarten may be established; if 10 or more teachers, a superintendent may be employed; and if 1500 census children, a board of trustees, numbering 5, is to be elected. Vacancies, if not filled by election, are filled by appointment by the Deputy State Superintendent for the district.

School Support. — The state received the 16th and 36th sections of land for schools on its admission to the Union. In 1882 these lands, less a small amount sold, were exchanged with the government for 2,000,000 acres, to be located by the state on any free government land. The 500,000 acres of land granted to new states, the 5 per cent of public land sales, and all fines collected under the penal laws were also added to the permanent state school fund. This fund now amounts to approximately 2⅓ million of dollars, and the income, due to the small state school census, gives a large per capita apportionment. The salaries and expenses of the state office and deputies, the Emergency Fund, and the library fund, are all deducted before apportionment. In addition a state school tax of 10 cents on the $100 (raised from 6 cents in 1911) is levied and added to the income from permanent funds. The distribution is made semi-annually to the counties on the basis of census children, 6–18 years of age. State money can be used only for teachers' salaries. A county tax of from 15 cents to 50 cents (average 25 cents) is also levied for contingent expenses, and a special district tax up to 25 cents may also be levied. All state and county school money is distributed to the districts within the county on the basis of 70 per cent on teachers (1 teacher calculated for every 30 census children, or fraction thereof) and 30 per cent on school census. Also a sum of from $3 to $5 per teacher and, in addition, from 5 cents to 10 cents per census child, as determined by the State Board of Education, is apportioned for school library purposes.

Teachers and Training. — The state has about 500 teachers, few of whom are paid less than $70 per month, and salaries of $100 and $110 are common. Primary, grammar, and high school certificates are granted upon examination, though the primary certificate is fast passing out. The standards for these examinations are high. A State Board of Educational Examiners, composed of two from the State Board of Education, the five deputy state superintendents, and three others appointed by the State Superintendent, examine and grade all examination papers, and report to the State Board of Education, which then grants the certificates to teach. About 40 per cent of the teachers certificated for the state have been certificated on credentials (normal school, college, or state life diplomas) from other states. The state is relatively liberal in the matter of inter-state recognition of diplomas and credentials from other states. The state normal school is a department of the University of Nevada at Reno. The state has also recently begun the establishment of normal school classes in the high schools of the state for the training of teachers for the rural schools. This course must be thirty-six weeks long, the candidates for entrance must have a high school diploma or a primary teacher's certificate, and at graduation a three-years' certificate, not renewable, and good in only a one-room school, is granted.

Secondary Education. — Within recent years there has been a marked gain in the number of high schools in the state. In 1890 there were 7 district high schools in the state; in 1900 there were 9 district high schools and 1 county high school; while in 1910 there were 11 district and 10 county high schools. The number of secondary school students has increased much faster than the number of secondary schools, and practically all of the schools now have a four-years' high school course. County high schools may be formed in any county by petition of one fourth of the voters, and a majority vote at an election. For these a county board of education of three is elected, who manage the school, under the direction of the State Board of Education, and determine the annual tax for the same. Such schools are open to any eighth-grade graduate in the county.

Educational Conditions. — Educational conditions in the state are now very good. The state system of supervision and inspection is efficient; there is a higher degree of centralization of authority than is found in many states; the school laws as a whole are good; and good provisions for the education of all children are made. Whenever five children can be found near enough together to maintain a school, the state sees to it that one is provided. The standards for teachers' certificates are higher and better than in most eastern states, the salaries paid are good, and the instruction offered is very good, considering the sparse population. There are a number of good high schools in the state. School libraries exist in each school district, and free textbooks may be provided by vote of the district. A six months' term of school is mandatory on all districts, and eight months if the funds at hand will provide it. The educational obligations of the state are well recognized in the large state and county taxation for education. Four cities and towns have city superintendents. Of the total population, 83.7 per cent live in rural districts. E. P. C.

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NEVADA, UNIVERSITY OF, RENO, NEV. — The State University and the only institution of higher learning in the state. It had its inception in the Federal land grants to Agricultural and Mechanical Colleges and Universities. There was no immediate demand for such a college, and it was not until 1873 that the State Legislature provided for its establishment at Elko. The University was opened in 1874 and existed for twelve years as a preparatory school with but few pupils. In 1886 the school moved to Reno, where after a lapse of one year it opened with the title University. Since then the growth has been gradual. At present the University comprises the following schools and colleges: college of arts and science, college of agriculture, including the schools of agriculture and of domestic science; the college of engineering, including the Mackay school of mines, the school of mechanical engineering, the school of civil engineering, and the college of education. The University campus covers an area of 49 acres, on a site which gives a commanding view of the city, valley, and mountains. The buildings number 15, all built by the state except the Mines Building, the gift of C. H. Mackay. The value of the University grounds and buildings is $78,197 for grounds, $528,476 for buildings, of which sum $72,266 is for dormitories. The total receipts for the biennial period 1911 and 1912, according to the regular appropriations, exclusive of additions and buildings, will be $412,180, of which sum $220,000 is from Federal grants and $192,130 from state appropriations. The enrollment of University students in 1912 was 223. The faculty numbers 48. G. O.

NEVIN, JOHN WILLIAMSON (1803–1886). — College president; was graduated from Union College in 1821, and the Princeton Theological Seminary in 1826. He was professor at the Western Theological Seminary, Allegheny, Pa., 1820 to 1840, at the German Reformed Theological Seminary, Mercersburg, Pa., 1840 to 1853, and president of Franklin and Marshall College, 1866 to 1876. He was the author of several religious works. W. S. M.

NEW ATLANTIS. — See Bacon, Francis; Utopias, Education in.

NEW BRUNSWICK, EDUCATION IN. — See Canada, Education in.

NEW BRUNSWICK, UNIVERSITY OF, FREDERICTON, N.B. — Founded in 1800 as the College of New Brunswick. From 1805 the institution received annual grants from the Provincial Treasury, and from 1829 grants from the Crown. A Royal charter was obtained in 1828, incorporating the College as King's College. In 1845 all religious tests, except for the professor of theology, were abolished. After a commission of inquiry had reported, the University of New Brunswick was established in 1859 in place of the College. Four-year courses leading to the B.A. and B.Sc. degrees are offered to students, men and women, who have satisfactorily passed the entrance examinations. The courses are divided, according to the English system, into ordinary and honor courses. In the department of applied science courses are offered in the various branches of engineering and in forestry and lead to the degree of B.Sc. The University also confers all the usual higher degrees, including the B.C.L. and D.C.L. The University is affiliated with the universities of Oxford, Cambridge, and Dublin. The enrollment in 1910–1911 was 241.

NEW CALEDONIA. — See French Colonies, Education in.

NEW COLLEGE. — See London, University of.

NEW ENGLAND ASSOCIATION OF COLLEGES AND PREPARATORY SCHOOLS. — See College Examination and Certification Boards; College Entrance Requirements.

NEW ENGLAND COLLEGE ENTRANCE CERTIFICATE BOARDS. — See College Examination and Certification Boards.

NEW ENGLAND JOURNAL OF EDUCATION. — See Journalism, Educational.

NEW GUINEA, EDUCATION IN. — See Netherlands, Colonies of, Education in the.

NEW HAMPSHIRE, STATE OF. — Originally a part of Massachusetts, but organized as a separate territory in 1680. Entered the Federal Union in 1788 as one of the thirteen original states. It is located in the North Atlantic division, and has a land area of 9031 square miles. It is about one fifth the size of the state of New York, and about three fourths as large as Holland. For administrative purposes the state is divided into ten counties, but these have no educational significance. The counties are in turn divided into 231 towns and 26 originally independent school districts, and these are the educational administrative units of the state. In 1910 New Hampshire had a total population of 430,572, and a density of population of 47.7 per square mile.

Educational History. — The famous Massachusetts laws of 1642 and 1647 applied to New Hampshire, and continued to be in force for nearly a century. Dover, Exeter, and Hampton early provided for schools, and, what was unusual at that time, for girls as well as for boys. In 1680, the year of separation from Massachusetts, the first school law was passed, requiring the selectmen of the town to raise money, by assessment, for erecting and repairing houses of worship, parsonages, and schoolhouses, and for securing a teacher for the town. The old Massachusetts laws were continued in force, by common consent, and in 1719 the Massachusetts law of 1647 was definitely reënacted, but with the fine increased from £5 to £20. Two years later it was enacted that selectmen failing to enforce the law should be liable in their personal estates.

During the first fifty years of the independent existence of the territory, the Massachusetts policy of granting land for education was continued, and grants of a school lot in each township were made quite generally. In a few towns there are local funds which are the product of these grants.

Education in New Hampshire, as elsewhere in New England, declined during the eighteenth century. Little was done in the matter of schools, few grammar schools were in existence, fines were cut down, and laws were not enforced. The first state constitution of 1776 made no mention of education. New state constitutions were adopted in 1784 and 1792, and in each of these the general section relating to the encouragement of literature and learning, embodied in the Massachusetts constitution of 1780, was incorporated with only two words changed, and this has remained to the present as the sole constitutional requirements with reference to education.

In 1789 the first state law with reference to education was enacted, and all former laws were repealed. The rate of school tax which a town must raise was fixed for the first time, at the ratio of $5 for every $1 received from the state; an English Grammar school was ordered to be established in the smaller towns, and a Latin Grammar school in the larger towns; and an examination of teachers, by ministers, college professors, or schoolmasters, was instituted for the first time. In 1791 the rate of town taxation was changed to 7½ to 1; in 1795 to 35 to 1; in 1804 to 45 to 1; in 1806 to 75 to 1; in 1808 to 70 to 1; in 1818 to 90 to 1; and in 1840 to 100 to 1. By 1855 it had reached 200 to 1; by 1870, 350 to 1; and now stands at 750 to 1. This reveals how the burden of school support has gradually been shifted to the towns, until to-day the share carried by the state is very small. Only within recent years has the state begun to make special subsidies and equalization grants to overcome some of the defects of this method of school maintenance.

Up to the nineteenth century the town had been the unit in all school administration, but in 1805, following the lead of Massachusetts, the towns were empowered to subdivide into school districts. Town unity was partially retained for a time by the law of 1808, which directed that each town at its annual meeting should elect a school committee of three or more to visit and inspect the schools. Should the town fail to elect, the selectmen were to act as a school committee. In 1827 the number was fixed at three to five, and a district committee of one, to be chosen by the towns, was to be appointed to look after the schools in each district. To the town school committee was given the power to examine all teachers for the towns; to dismiss incompetent teachers and unruly pupils; to determine the textbooks to be used; to make an annual written report to the town meeting; and they were directed to visit and inspect the schools twice yearly; to encourage scholars to attend. The first statistics date from this time. In 1829 the town control was still further undermined by a law which authorized each school district to appoint its own district committee, of from one to three residents, and to give to this district committee power to select teachers, to provide board and fuel, and to supervise the school. In 1833 the culmination of the district system was reached in a law which permitted the towns, on account of expense, to dispense with the superintending town school committee, and thus leave the schools under district control. This condition of affairs continued for fifty years. A few of the cities escaped by organizing under special laws, Portsmouth in 1826 being the first. In 1857 two or more contiguous districts were authorized to unite. In 1870 permission to return to the town system of school administration was granted to the towns, and in 1885 the district system was abolished by legislative act, reducing at once the number of districts and district boards from 1890 to 275, and resulting in the immediate abandonment of 495 small schools.

In 1826 schoolmistresses were first recognized in the law, and in 1858 they were required to meet the same standards as men for certification. In 1827 children whose parents did not provide books might be supplied by the school committee, and in 1833 the law directed school committees to provide destitute children with free books. In 1883 towns and districts were authorized to supply free textbooks to all. In 1829 the Literary Fund, established in 1821 by a tax on banks, for the endowment of a college, was ordered distributed among the towns, on the basis of state taxes paid, for the support of free public schools. In 1847 the basis of distribution was changed to school enrollment.

In 1830 the first high school was established at Portsmouth; in 1848 the third district of the town of Somersworth was permitted to establish one; and later in the same year any district was authorized by vote to establish and maintain a high school, and to elect a high school committee of from five to seven. In 1846 towns were permitted to contribute as much as 5 per cent of their school money for the aid of teachers' institutes, which were then first established by law. In 1851 this was reduced to 3 per cent, and in 1857 to 2 per cent, and in 1861 they were abolished as ineffective. In 1868 they were again ordered held, and state aid for them was granted, but in 1874 they were once more abolished. In 1883 they were again reëstablished and have since remained. A State Teachers' Association was organized in 1854.

The beginnings of state school supervision were made in 1846, when a State School Commissioner, to be appointed by the Governor and Council, was authorized. He was to spend twenty weeks each year among the counties, encouraging education; was to collect educational statistics; and was to make an annual report to the General Council. In 1850 the office was abolished, and county commissioners, one for each county, took his place as supervisory officers, and together they constituted an *ex officio* State Board of Education. Despite efforts to reëstablish the state office, this system of county supervision continued until 1867, when the county school commissioners were legislated out of office, and the office of State Superintendent of Public Instruction was established. The new Superintendent was to be appointed by the Governor for two-year terms, and the State Superintendent, Governor, and Council together were to constitute an *ex officio* State Board of Education. In 1874 the State Board was abolished, but the State Superintendent has been continued to the present time.

In 1848 the first law relating to truancy was enacted, and all children working in factories were required to have had three months' schooling each year. In 1870 all children eight to fourteen years of age were required to attend school for twelve weeks each year, six weeks of which must be consecutive. The law was further amended in 1901 to make it practically conform with the truancy and child labor laws of the other New England states In 1866 the State Agricultural College was established as a department of Dartmouth College, but in 1891 the connection with Dartmouth was severed, and the College was moved to Durham and given an independent status. In 1870 a state normal school was established and located at Plymouth. In 1895 the State Superintendent was authorized to institute a system of examinations for state teachers' certificates. In 1895 the employment of a superintendent by two or more towns was authorized, and in 1899 supervisory unions of two or more towns for the purpose were provided for, and state grants for the partial payment of the salary of the superintendent were begun. In 1899 annual state appropriations were begun, from the state treasury, to be used in equalizing the local tax rate for schools in those towns where the burden was excessive, and in making state grants in aid of supervision. In 1901 towns not maintaining a high school were required to pay the tuition of their pupils in high schools elsewhere, and state aid for the purpose, to those whose tax rate exceeded a certain rate, was begun. These grants have since been materially increased.

Present School System. — At the head of the school system is a Superintendent of Public Instruction, appointed by the Governor for a two-year term. To him is given general supervision and oversight of the educational interests of the state. He is authorized by law to prescribe the forms of blanks, reports, and registers to be used in the state; to receive and preserve all school documents; to investigate educational conditions in the state; to visit the schools and lecture in the towns; to hold at least one institute in each county each year; to audit the expenses for such, and to draw on the state treasury to pay for the same out of the income of the institute fund; to recommend to school boards desirable books for instruction in temperance physiology and hygiene; to prepare a biennial report of his work and to issue biennially the school laws of the state. He also approves high schools for tuition grants and supervisory unions for supervisory grants; holds examinations for and grants state certificates to teachers; acts *ex officio* as one of the Board of Trustees for the state normal school, and as regent (secretary) of the State Board of Medical Examiners.

Below the state are 231 towns and twenty-six independently organized districts. Since 1885 each town has been constituted a single school district, except that the independent school districts in existence at that time were permitted to continue, unless they voluntarily gave up their existence and united with the town. Each district is required to hold an annual school meeting for the election of officers, hearing the annual reports and voting funds. Women may vote at these meetings. The meeting each year elects a moderator, clerk, one or more auditors to examine all books and accounts, and one member of a school board of three, to serve for a three years' term. Any district, by vote in annual meeting, may require the trustees to employ a superintendent of schools, and two or more towns having twenty to sixty teachers may unite to form a supervisory union for the same purpose. If a high school is maintained, there may also be a high school board of three, six, or nine, as determined by vote, or the high school district may be consolidated with the district or town and placed under the control of the school board.

Districts (or towns) may raise money for current expenses, buildings, repairs, equipment, and debts; may borrow four fifths of the money necessary to erect a building, payable in five years' time; may vote to maintain a high school, or unite with another town in doing so, or contract with a high school, academy, or seminary to educate their high school pupils for them; may determine the conditions of admission to the schools; and must raise by local taxation a sum not less than $750 for every $1 of money received from the public treasury.

The district or town school boards are to select, employ, and for cause dismiss all teachers; must provide a sufficient number of schools, and may expend 25 per cent of the money raised for the conveyance of pupils; must include temperance physiology and hygiene and the constitutions of the United States and of New Hampshire among the required studies in the schools; must provide free textbooks for pupils, and fix prices at which parents wishing to provide their own may buy them; are supposed to hold examinations for teachers in June or July of each year, issuing one-year local certificates to those found satisfactory; must visit the schools twice each term; must appoint truant officers for one-year periods, and fix their compensation, and must prosecute violations of truancy or child labor laws; and must make annual reports to the selectmen of the town and to the State Superintendent of Public Instruction. If a superintendent of schools is employed, most of the duties devolving on district boards are delegated to him. On a petition of 5 per cent of the voters in any district of 5000 inhabitants or over, evening schools must be established for the education of children over fourteen.

School Support. — The state received no land for education from the general government, and the Surplus Revenue distributed in 1837 was spent for general state purposes. The state has never established a permanent common school fund. The proceeds of some state lands, ordered to be sold in 1867, now known as the Institute Fund, constitutes the only permanent state fund, and the annual income from this is used to defray the expenses of teachers' institutes. The Literary Fund is the proceeds of an annual tax levied on bank, building and loan, and trust company deposits of persons not resident in the state, and at present produces about $40,000 each year. This is distributed to the towns on the basis of the number of children enrolled in the schools for at least two weeks each year, and is worth about sixty cents per pupil. Any districts existing within the towns receive their proportion on the basis of valuation. The state also makes grants annually to assist poor towns in paying the tuition of high school pupils; for assistance in paying the salaries of superintendents (the state paying one half the salary); and for giving extra aid to towns having less than 3500 total population, and whose valuation is less than $7000 per child in average daily attendance. This last is granted to the towns in direct proportion to the average daily attendance, and in inverse proportion to the valuation per child. All other school expenses are paid by the towns and districts, and the amount so raised averages about one half more that that required to be raised.

Of all school revenues raised during the last year for which statistics are available, 7 per cent came from state sources, 88.2 per cent came from local taxation, and 4.8 per cent came from local funds, tuition fees, gifts, excess of dog taxes, town treasury payments, and other miscellaneous sources. The inequalities under this system, due to inequalities in wealth, are large, and these inequalities the state has attempted to equalize in part by a wise system of state aid.

Educational Conditions. — Of the total population of 1910, 22.4 per cent were of foreign birth. But few of the native-born population are illiterate; but for the foreign born about one fifth are so classed. Of the foreign born, 50 per cent were French Canadians, 16 per cent were English Canadians, and 90 per cent were from Canada or the British Isles. The percentage of children five to eighteen years of age in the total population is lower than in any other state of the Union except Nevada. There are practically no negroes in the state, the whites constituting 99.8 per cent of the total population; 40.8 per cent of the people live in rural districts, and 42 per cent in cities of over 8000 inhabitants. The attendance and child labor laws are good. Truant officers must be appointed by each town and district, and they may be directed to inspect factories. Three state inspectors also assist in the enforcement of the truancy and labor laws. No child under twelve can work at all in any manufacturing establishment; and no child under sixteen during the hours the schools are in session without an age and schooling certificate, showing that he can read and write the English language. If over sixteen and unable to read and write, such pupils must attend evening schools, up to twenty-one, unless excused on account of health. All children under sixteen must attend school unless employed. Attendance at a private school is accepted only when the school is taught in the English language, and has been inspected and approved as equal in instruction to the public schools of the town, and when attendance is looked after as required by law.

There are no statutory school studies, aside from temperance-physiology and hygiene, humane education, and the constitutions of the United States and of New Hampshire. About 60 per cent of the schools of the state are classed as graded schools. Four cities maintain evening schools, and about twenty-five supervisory unions have been formed. The laws for the location of schoolhouses, change of property from one district to another, power granted to the annual district meeting, etc., show the same oversensitiveness for the feelings of communities and for a small and aggrieved minority that characterizes much of the New England school legislation.

Teachers and Training. — Teachers' certificates are of two kinds. The local certificates, granted by local school boards, supposedly on an examination in the subjects which the teacher is to teach, but in practice usually without an examination, and valid for one year and only in the district, constitute one kind, and are held by most of the teachers of the state.

The other kind is granted on the basis of a written examination, given under the direction of the State Superintendent, and to graduates of the normal school. This form is required of all district superintendents, and is valid anywhere in the state. The local district examinations are so easy or so nearly extinct that there is little to impel teachers to attempt these state tests.

For the training of new teachers, the state maintains the normal schools at Plymouth and Keene, and four cities (Concord, Manchester, Nashua, and Portsmouth) maintain city training schools. For the training of teachers in service the State Superintendent is directed to hold at least one teachers' institute in each county each year, or to appoint the principal of the normal school to do so, to audit the expenses, and to draw on the state treasury to pay the same from the income of the Institute Fund. From twenty to twenty-five one-day teachers' institutes are held each year, with about one half of the teachers in attendance. An institute for superintendents is also held, and an eight weeks' summer institute at the normal school. Attendance at a teachers' institute is optional, though teachers may close their schools and attend one day each term, and receive pay for attendance. The last report of the State Superintendent shows that from thirty-nine towns no teacher has attended an institute in two years, from nine towns in four years, and from six towns in six years. Many other towns have been represented by one, two, or three teachers only.

Secondary Education. — Seventy-two public high schools were reported in 1910 as existing in the state. A high school, once established, cannot be changed in location or discontinued except by order of the Superior Court for the town, and on petition of the school board. To be approved, a high school must maintain at least one four-year course, embracing such subjects as are required for entrance to colleges, and including the constitution of the United States and of New Hampshire. In special cases, the State Superintendent may approve partial courses for partial state aid. A number of academies and seminaries have been approved for the attendance of pupils at public expense.

Higher and Special Education. — The New Hampshire College of Agriculture and Mechanical Arts at Durham is the only higher institution supported by the state. This institution offers instruction in general science, agriculture, and engineering, and is the only college in the state open to women. Dartmouth College (*q.v.*), at Hanover, a nonsectarian institution opened in 1769, and St. Anselm's College, at Manchester, a Roman Catholic institution opened in 1893, are two additional higher institutions, for men only. The State Industrial (Reform) School, at Manchester, is the only special institution maintained by the state. E. P. C.

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NEW HARMONY. — See PESTALOZZIAN MOVEMENT IN THE UNITED STATES; OWEN, ROBERT.

NEW JERSEY, STATE OF. — One of the thirteen original states. It is located in the North Atlantic Division, and has a land area of 7514 square miles. It is about one seventh the size of the state of New York, and about one half as large as Switzerland. For administrative purposes the state is divided into twenty-one counties, and these in turn into 458 cities, independent boroughs, and school townships. In 1910 New Jersey had a population of 2,537,167, and a density of population of 333.7 per square mile. Excepting Rhode Island and Massachusetts, it is the most densely populated state in the Union.

Educational History. — Situated near the center of the different colonies, the development of education in New Jersey was the product of a number of influences. The Dutch crossed from New Amsterdam, the English came from Connecticut, Scotch and Scotch-Irish Presbyterians came from Great Britain, the Swedes settled along the Delaware, and the Quakers came over from Pennsylvania. The population was thus a compound of these various elements. The first school was established by the Dutch at Bergen in 1661 or 1662, and in 1673 it was ordered that all the inhabitants be compelled " to pay their share toward the support of the precentor and schoolmaster," thus making it a publicly supported school. There seems to have been much difficulty in enforcing this, however, as the people " obstinately refused to pay their quota." After the transfer of New Amsterdam to the English in 1664, the English soon extended their control over northern New Jersey, and the English language and English methods ruled in the schools. See section on early education in NEW YORK, STATE OF.

As early as 1665 an English colony had settled at Elizabeth, and in the founding of the neighboring town of Woodbridge in 1669, 100 acres of land were set apart for education. A school was established here in 1689. In 1666 the town of Newark was settled by two migrations from the towns of Milford, Branford, and Guilford, Connecticut, and ten years later a schoolmaster was appointed by Newark " to do his faithful, honest, and true endeavor to teach the children or servants of those as have subscribed, the reading and writing of English, and also arithmetick, if they desire it; as much as they are capable to learn and he capable to teach them within the compas of this year." Other early settlements were made at Middletown, Freehold, Shrewsbury, Piscataway, and Perth Amboy.

In 1693, and in amended form in 1695, the East Jersey Assembly, at Perth Amboy, enacted " An Act for establishing schoolmasters in this province," which authorized the inhabitants of any town, under warrant of a justice of the peace, to meet and choose three men of the town " to make a rate for the salary and maintenance of a schoolmaster." The consent of a majority was to make the rate a binding one on all. What proportion of the towns established schools under the provisions of this law we do not know.

In 1682 the Assembly of West Jersey granted the island of Matinicunk, located in the Delaware River, being about 300 acres in extent, to the town of Burlington, " from henceforth and forever hereafter for educational purposes." The early Quaker settlers of this western province were a well-educated people. With them the schoolhouse was the general accompaniment of the house of worship. Schools and meeting houses were accordingly soon established by them in their towns, and the schoolmaster was generally appointed by the church session, instead of the civil authority, as was the case in early Massachusetts history. See MASSACHUSETTS, STATE OF; DISTRICT SYSTEM.

In 1702 the two provinces of East and West Jersey were united and placed under the Governor of the colony of New York. For the following seventy-five years, up to the Revolutionary War, during all of which time this arrangement continued, there was almost no legislation relating to education. (See NEW YORK, STATE OF, EDUCATIONAL HISTORY.) Schools were still maintained in many of the colonies, but they were of a voluntary and private rather than a public nature. A subscription elementary school was maintained in a small number of the towns; a few private grammar schools (of which the Log College of Wm. Tennent, at Nashamany, was a type) were provided; and the Friends, in Yearly Meeting, in 1746 and again in 1787, laid down directions concerning education. In their resolutions they declared that " the education of our youth in piety and virtue, and giving them useful learning under the tuition of religious, prudent persons," was extremely desirable, and they therefore urged that the Society's meetings " be excited to proper exertions for the institution and support of schools." The main acts of educational importance in New Jersey during the first three fourths of the eighteenth century were the establishment of the College of New Jersey, now Princeton University, in 1746; the founding of Rutgers College, at New Brunswick, in 1766; the confirming in 1769 of the 100 acres for schools, granted a century earlier to Woodridge township by George III; and the appointment of a Board of Trustees for the management of the lands, to insure their application to the original purpose of the grant. The War of the Revolution put an end to English control and to the early colonial schools.

New Jersey adopted a state constitution in 1776, but this contained no mention of education. The Federal Constitution was ratified in 1787, but no new state constitution was adopted at that time. A new interest in education seems to have been awakened after the establishment of the new Federal Government, and many academies were founded in different parts of the state. It was not until 1816, however, that any official state action was taken. In this year an act was passed which made the beginnings of a state school fund for the support of schools. An annual state appropriation of $15,000 was made to start the fund. This was to be invested in United States 6 per cent bonds, and the interest was to be added to the principal and reinvested. In 1818 the chief state officers were made trustees for the growing fund; in 1824 this was changed to an annual addition of one tenth of the income from state taxes; and, in 1829 it was further provided that taxes from banking, insurance, and other corporations should be added to the fund. In 1820 the townships (or towns, as they were frequently called) were first authorized to raise money by taxation for school purposes, though until 1838, excepting the one year from 1830 to 1831, money raised for support was limited to the education of " such poor children as are paupers." In 1828 townships were further permitted to raise money, by vote at township meetings, for the erection and repair of school buildings.

An extensive investigation was made in 1828, which showed that one third of the school children of the state were growing up without any chance of an education. The law of 1829, the first to provide any organized plan for a school system for the state, was the result of this investigation. Each township was to elect a school committee who should divide the township into school districts; examine and license teachers; visit the schools, at least every six months; and make a report to the annual school meeting and to the Governor of the state. Three trustees for the districts, a district school census, and annual district meetings were provided for, and a state appropriation of $20,000 annually for support was made. This latter was to be distributed to the counties on taxables, and to the districts on census. The next year, however, this newly established school system was abolished, largely through the influence of the friends of private and church schools. By the laws of 1830 and 1831 the old limitation of support to the education of poor children was reëstablished; the distribution of the state appropriation was so changed as to include all private and parochial schools, as well as the township schools; and both district lines and the examination of teachers were abolished. It was not until 1838 that these reactionary laws were finally repealed. In that year a convention of the friends of public schools free from all denominational control, issued an address to the people, and the result was such a popular manifestation that the legislature repealed the law of 1831 and enacted a new one, which contained many of the features of the law of 1829. The religious orders were still aided; the licensing of teachers was made optional; the mention of pauper children as the only ones entitled to state aid was finally abandoned; and the annual state appropriation was increased to $30,000.

In 1844 a new constitution was adopted for the state, and in this, under the head of legislative powers, a paragraph was inserted which declared the school fund to be a perpetual fund, and the income to be appropriated only for the support of public schools. In 1875 this was further amended by inserting the word " free " between " public " and " schools," and adding a mandatory clause requiring the legislature " to provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all children in the state between the ages of five and eighteen years." These remain the only constitutional provisions relating to education which the state has ever adopted.

In 1845 the beginnings of state supervision were made by the passage of a law permitting the appointment of a State Superintendent of Public Schools for the counties of Essex and Passaic, with liberty to the other counties to avail themselves of this state supervision. The following year a new school law was enacted which extended state supervision to the entire state; provided for local supervision by townships, by supplanting the township school committees by a town school superintendent; made the licensing of teachers obligatory; and required the townships to levy a local tax double the amount of any state school funds received. From 1846 to 1866 the State Superintendent was elected by the Trustees of the School Fund, but since 1866 he has been elected by the State Board of Education. Only four different men have served the state as State Superintendent during the forty-five years from 1866 to 1911. In 1848 the townships were permitted to use the interest on the Surplus Revenue for schools; in 1851 the state appropriation was increased to $40,000, and a limit of $3 per census child placed on district taxation; in 1854 teachers' institutes were first established, and a state appropriation of $100 for each was made; in 1855 the first state normal school was established; and in 1858 the state appropriation was further increased to $80,000. Here matters rested until after the Civil War.

In 1866 an *ex officio* State Board of Education, consisting of the Governor and state officers, was created, and the State Superintendent was changed to be its executive officer and secretary. In the following year a new school law was enacted, which practically created the modern system, and has formed the basis for laws since that time. The State Board of Education was reconstructed and given enlarged powers; county superintendents were created to supersede the township superintendents; state, county, and city boards of examination were provided for, and a certificate from one of the three required of all teachers; the various district trustees in each township were constituted a township board of trustees; corporal punishment was forbidden; the state appropriation was increased to $100,000 annually; and the limitation of $3 per census child on district taxation was removed. In 1871 the rate bill (*q.v.*) was finally abandoned and the schools made entirely free. To accomplish this and to provide a nine months' term as required, a state tax of two mills was imposed, in addition to the appropriation, and additional township taxes were permitted, when necessary, to meet the demands of the law. In 1874 a compulsory education law was enacted, and in 1876 all state aid to private or parochial schools was finally forbidden.

In 1881 the first of a long series of constructive legislative acts was passed, whereby any district, raising by subscription or taxation a sum of not less than $3000 a year and not over $5000 for industrial training, was to receive an equal amount from the state, for the same purpose. In 1887 the same provisions were extended to districts raising from $500 to $5000 a year for manual training. In 1888 the school districts of any township were permitted to consolidate and to provide a township form of organization; and in 1894 transportation was permitted. The same year the district system, except for cities and boroughs, was abolished by law, and a form of the townships-county system was instituted. In 1894 scientific temperance was required in all schools, and a free textbook law enacted; and in 1896 the State Board of Education ordered a uniform course of study and uniform standards of promotion to be instituted by counties. In 1896 a teachers' retirement law was passed. In 1898 the State Board of Education established a "Bureau of Information for Teachers and School Officers," which it has since conducted.

Beginning with 1900, constructive legislation has been even more marked than during the previous decade. In that year the State Board appointed a supervising architect, and began the state supervision of all schoolhouse plans; and annual grants of $600, to any district or township which appointed a superintendent of schools or a supervising principal, were begun. County superintendents were required to hold a state teachers' certificate, and their salaries were changed from a school census to a teacher employed ($7 per teacher, in 1902 increased to $8) basis, and materially increased; the normal school course was extended and improved; a more liberal policy in the recognition of diplomas and training in place of examinations was begun; and kindergarten classes were first authorized. In 1901, after ten years of investigation of the results of the school census, the state school tax was increased to two and three fourths mills, and the basis of apportionment changed from school census to a combination of teachers and attendance. In 1903 all school districts were made corporations, independent of the local municipal governments, thus erecting the school system as a state rather than as a local undertaking. In 1904 the State Board of Education appointed a high school inspector, and began the inspecting and grading of high schools. In 1905 county superintendents were given a uniform salary of $2000, and schooling for all children in the state until twenty years of age was made possible. In 1906 an additional source of state taxation for education was provided, which has doubled the state appropriation for schools, in the form of a railway tax on all main-stem and first-class railway property in the state. With this increase in funds, the appropriation for teachers in high schools was doubled, and a grant of $25 of state aid per pupil was made to all districts sending pupils to schools elsewhere. A new state normal school was also established at Montclair in this same year. In 1909 a teachers' tenure act was passed, giving indefinite tenure to teachers after three years of continuous employment. In 1911 an important law reconstructed the State Board of Education, abolished the office of State Superintendent of Public Instruction and created instead the office of Commissioner of Education, with Assistant Commissioners, as outlined below. All city boards of education were made appointive by the mayor, instead of in part elective; provision was made for the instruction of sub-normal and defective children; city teachers' certificates were abolished; and tenure and the civil service act were extended to all employees of school departments.

Present School System. — The New Jersey system, as it exists at present, is a somewhat closely organized state school system. At the head is a State Board of Education of eight members, appointed by the Governor with the concurrence of the Senate, and for eight-year terms (after the first appointments). The general duties of this State Board are to make rules and regulations for the carrying out of the school laws, for the management of teachers' institutes, and for the examination and certification of all teachers; to appoint all county superintendents, and to approve their expense accounts; to prescribe a uniform system of bookkeeping; to hold hearings; to appoint a supervising principal for union schools, and to consolidate or discontinue high schools, when deemed desirable; and to determine tuition rates and compel districts to receive pupils. In its power to make such rules and regulations as from time to time are found necessary, or deemed important in carrying out the provisions of the school laws, the State Board is enabled to determine many details in the administration of the school system of the state which in nearly all other states require legislation.

The State Board also acts as a Board of Trustees for the two state normal schools, for the New Jersey School for the Deaf, for the State Manual Training and Industrial School for Colored Youth, for the summer school for instruction in manual training, agriculture, and home economics, and the Farnum Preparatory School. The Board approves all books and apparatus to be bought for schools; approves the course of instruction and grants of money to schools offering courses in manual training or industrial work; and approves the courses of instruction in high schools, and inspects and grades the schools.

Probably the most important function of the State Board of Education is the selection and appointment of a Commissioner of Education for the state, who acts as the executive officer of the Board. He receives a salary of $10,000 a year, is appointed for five-year terms, and no residence restrictions are to be insisted upon in making the appointment. With the advice and consent of the State Board, he appoints four Assistant Commissioners at $4500 salary, and the State Board also appoints an Inspector of Buildings and an Inspector of Accounts, each at $2000, the first of whom approves all school plans and buildings, and the other inspects the accounts of the district officers. Three of the Assistant Commissioners act as inspectors of high schools, of elementary schools, and of industrial and agricultural education, and the fourth Assistant Commissioner hears all controversies and decides all appeals on school law questions. The specified duties of the Commissioner of Education are to ascertain whether the system of education provided is thorough and efficient; to prescribe a minimum course of study for both elementary and high schools; to prescribe rules for the promotion of pupils in the elementary schools, and to prescribe uniform examinations for eighth-grade graduation and admission to the high schools, which shall be open alike to public and private school pupils; to prescribe the Binet, or other tests, for use in the schools; to withhold funds from any school district not obeying the law; to provide instructors and lecturers for teachers' institutes; to hold an annual convention of all city and county superintendents; to make a monthly report to the State Board of Education, and an annual report for the Board. The State Commissioner acts *ex officio* as a Trustee of the State School Fund, and apportions the income to the counties; as a member of the State Board of Examiners; and as a member of the Board of Trustees for the Teachers' Retirement Fund.

For each of the twenty-one counties of the state the State Board of Education appoints a county superintendent of schools. The appointment is for a three-year term, the appointee must hold a state teacher's certificate, and a uniform salary of $2000 is paid to each, by the state, with an added allowance for expenses and clerical assistance. Each county superintendent has the general supervision of the schools of his county, cities under city superintendents excepted; is to visit and examine all schools, and to note the condition of the school property; is to advise and counsel with the boards of education within the county; may recommend, with reference to courses of instruction, methods, management, or buildings; appoints members of Boards of Education, when the people fail to elect; carries out the instructions of the state office; and makes an annual report to the State School Commissioner.

Each township is a school district, but any city, incorporated town, or borough may be organized as a separate school district. For each, a board of education of nine members is elected or appointed for three-year terms, one third going out of office annually. In all cities the board is appointed by the mayor (since 1911), and in all townships, towns, or boroughs the members are elected by ballot at an annual school election. The general powers of all such Boards include the power to employ and dismiss teachers; to make rules and regulations, not inconsistent with law or the rules and regulations of the State Board; to purchase, lease, and sell schoolhouses, and to condemn land for school purposes; to select and provide textbooks and supplies; to admit and expel pupils; and to make an annual report to the county superintendent. Township, town, and borough boards may also appoint a supervising principal, or superintendent, or unite with other such boards to do so, and all such boards must meet together, semiannually, with the county superintendent for the consideration of school matters. Two or more townships, towns, or boroughs may hold an election and vote to consolidate their schools, the board of education for the consolidated district having the same powers as the boards of the districts voting to unite. Similarly, boards of education in two or more adjacent school districts may unite to provide a union graded school.

Boards of education in cities must appoint a city superintendent, who has the right of a seat and speech in the meetings of the board, but no vote. City boards of education are also to appoint a business manager to have general charge of all matters relating to school buildings, and a secretary, who acts as a secretary and general accountant for the school system. Each head of a department appoints all of his subordinates. The board may also appoint, on nomination of the superintendent, such assistant superintendents as it may desire, and fixes the salaries and tenure of all employees. The board must print an annual report and make an annual report to the State Commissioner. A board of school estimate, consisting of two members of the city board of education, two members of the city council, and the mayor of the city, determines the rate of city school taxes, which the council must levy, regardless of any charter restrictions.

School Support. — The school fund, begun in 1816, now amounts to about 4½ millions of dollars, and produces an income fixed by law at $200,000. Any deficit is made up from the state treasury. The surplus revenue of 1837 was distributed to the counties and in part used up, but the interest on the total received is a charge for which each county must provide. The income from this source is about $28,000 a year, and is used for schools. The chief support of the schools comes from a state tax of 2¾ mills on all property, and from state railroad and canal taxes. This property tax is materially reduced each year by an appropriation, made by the legislature from the state treasury.' Approximately 5 million dollars came from this source in 1910, and 2⅓ millions of this came from state railway taxes. Excepting 10 per cent of the 2¾ mills state tax, which is set aside as a reserve fund, all state money is distributed to the counties on the basis of their taxable wealth. The 10 per cent is also distributed to the counties by the State Board, in such a manner as in their judgment best equalizes the inequalities of the distribution of the other 90 per cent.

Within each county the county superintendent apportions the school money to the different townships, towns, boroughs, and cities on the following bases: —

For each superintendent or supervising principal	$600
For each assistant superintendent or supervising principal	400
For each teacher in a four-years' high school .	400
For each teacher in a three-years' high school .	300
For each teacher in all other kinds of schools .	200
For each temporary teacher, for 4 months or more	80
For each evening school teacher	80
For each pupil attending high school in another district	25
For each pupil attending elementary school in another district	5
For each teacher dispensed with by transportation	200
For transportation to other district, if school not close, 75 per cent cost.	

All that remains after setting aside the above sums is apportioned equally on the basis of attendance, and at the rate of so much per pupil per day. These apportionments provide for a very good equalization of burdens and advantages within the different counties. Any township, town, or borough may vote additional sums for maintenance, and city boards of school estimate may levy additional sums, as needed. All state money can be used only for salaries, fuel, transportation, and the payment of tuition.

In addition to the above, the state makes a number of annual grants, each one of which must be preceded by the district concerned raising an equal sum. These annual grants are as follows: —

For school district libraries, $20 the first year; $10 yearly thereafter.
For teachers' libraries, $100 the first year; $50 yearly thereafter.
For manual or industrial training, from $250 to $5000.
For evening schools for foreigners, over 14 years old, up to $5000.

Educational Conditions. — The conditions surrounding education in New Jersey may be said to be good. The state is densely populated. Only about one fourth of the population live outside of cities and towns of 2500 inhabitants and over, while one half of the total population live in cities of over 25,000 inhabitants. Three and one half per cent of the total population is negro, and 25.9 per cent is foreign born; 75.2 per cent live under urban conditions. The state is largely a manufacturing one, with many residential towns and extensive country estates.

The school system is one of the better centralized state systems, and the county is an important unit. The school laws make good provision for education. A nine-months' school term is required of all districts. Suitable accommodations and proper sanitary appliances must be provided by each district. All schoolhouse plans must be approved by the State Board of Education, and may be obtained from the state free. Definite standards and requirements as to school buildings are insisted upon. Any board may establish kindergartens, evening schools for pupils over 12 years of age, or for foreign born over 14 years; and any city of over 10,000 inhabitants may establish schools for workingmen. Every board may employ a medical inspector. Vaccination is insisted upon, unless excused for certain statutory reasons, and the cost of this is to be paid by the school authorities, if the parents are unable to pay. Textbooks and supplies must be provided free in all schools. All children in the state must be provided with free education, between the ages of 5 and 20, and no exclusion from any school may be made on the basis of race, religion, or color. Free high school education must be provided for all children applying for it, within or without the district. The kindergarten has made great headway since its adoption as a part of the state school system, and 30 per cent of the children now have been kindergarten trained. Corporal punishment is forbidden in all schools, public and private. All state prisons must provide schools offering an elementary school course, to be approved by the State Board of Education. All children, 7 to 17 years of age, must attend school regularly. Pupils over 15, properly employed, and who have completed the grammar school course, may be excused, but if under 17 and unemployed, they must attend a high school. Truant officers and parental schools are provided for, and any county may establish a school for the detention of juvenile offenders. A State Board of Children's Guardians exists for the care of indigent, helpless, dependent, abandoned, friendless, and poor children.

Teachers and Training. — A State Board of Examiners, consisting of the Commissioner of Education, the principals of the normal schools, and one other appointed by the State Board of Education, examines candidates and grants all state teachers' certificates. Diplomas of a university or college may be accepted in any examination in lieu of subjects covered. Three grades of state certificates are issued. Normal school and teachers' college diplomas, and state certificates from other states are recognized. A Bureau of Information for Teachers and School Officers, serving as a state teachers' bureau, is maintained by the State Board of Education.

Each county may have a county board of examiners, consisting of the county superintendent and three teachers appointed by him, for one-year terms, who then conduct three examinations yearly, for the three grades of county certificates issued. The examination and certification of teachers is done under rules and regulations of the State Board, and little is specified in the law. In 1911 the city boards of examination and city certification were abolished. All city school teachers must now hold a county or state certificate. All superintendents and assistant superintendents of schools, both county and city, must hold state teachers' certificates. Seventy-five per cent of the teachers in the state have had normal school or college training, or have advanced by study and hold a state teacher's certificate. For the training of future teachers, the state maintains two state normal schools, at Trenton (1855) and Montclair (1906), and the cities of Elizabeth, Jersey City, Newark, and Paterson also maintain city normal schools. Each Board of Education may make its own rules and regulations regarding the employment and tenure of its teachers, though, theoretically, teachers are supposed to have indefinite tenure after three years of service in any one position. There is a state salary schedule, fixing reasonably good salaries for all positions, which may be adopted by any city by a referendum vote. A State Teachers' Retirement Fund has been created, by which teachers paying 2 per cent (in some cases as high as 3 per cent) of their annual salaries may be pensioned after 20 years of service, if incapacitated. A city may retire any teacher on half pay after 35 years of service, 20 of which have been in the city.

Secondary Education. — Of the 458 school districts of all kinds in the state, 109 had approved four-years high schools, at the date of the last report, and 51 other districts had partial high schools. Most of these schools are large and well equipped. The state inspection and approval is more thorough than is found in most states. Any private high school may be inspected, on application, and if approved may be registered, which enables its graduates to be admitted to the state normal schools on the same terms as pupils from approved public high schools.

Higher and Special Education. — New Jersey maintains no state university, the two state normal schools being the culmination of the public school system of the state. The agricultural college grant is given to Rutgers College (*q.v.*), where the state maintains 120 state scholarships, and pays Rutgers $15,000 annually for the purpose. These are competitive, and county superintendents conduct examinations for them, each county being allowed as many appointments as it has members in the state legislature.

The following private institutions provide for the collegiate instruction within the state, though all are for men except the last, which is coeducational: —

Institution	Location	Opened	Control	For
Princeton University	Princeton	1746	Nonsect.	Men
Rutgers College	New Brunswick	1766	Reformed	Men
Seton Hall College	South Orange	1856	R. C.	Men
Stevens Institute of Technology	Hoboken	1871	Nonsect.	Men
St. Peter's College	Jersey City	1878	R. C.	Men
Upsala College	Kenilworth	1893	Luth.	Both sexes

As institutions for the education of special classes, the state maintains the New Jersey School for the Deaf, at Trenton; the New Jersey Training School for Feeble-Minded Girls and Boys at Vineland; the State Home for the Care and Training of Feeble-Minded Women at Vineland; the State (reformatory) Home for Boys at Rahway; the State (reformatory) Home for Girls at Trenton; and the State (secondary) Manual Training and Industrial School for Colored Youths, at Bordentown.
E. P. C.

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NEW LANARK. — See Owen, Robert.

NEW MEXICO COLLEGE OF AGRICULTURE AND MECHANIC ARTS, MESILLA PARK, N. MEX. — A coeducational institution established by the legislative assembly of New Mexico in 1889 under the provisions of the Morrill Act of 1862. The nucleus of the College which was opened in 1890 was the Las Cruces College, organized in 1889. The College receives the usual federal appropriations for agricultural and mechanical institutions and an annual state appropriation. The following courses are given: agriculture, mechanical engineering, electrical engineering, civil engineering, household economics, commerce, general science. In addition, college preparatory and industrial courses in agriculture, mechanics, domestic science, and business of high school grade are provided. Musical and preparatory departments are also maintained. The enrollment in all departments in 1911–1912 was 372, of whom 66 were in the college courses. The entrance requirements for the college courses which lead to the B.S. degree are fifteen units of high school work.

NEW MEXICO, STATE OF. — Ceded to the United states by Mexico in 1848, and organized as a territory in 1850. In 1863 the territory of Arizona was organized from the western half of New Mexico territory. In 1912 New Mexico was admitted to the Union as the forty-seventh state. It is located in the Western Division, and has a land area of 122,503 square miles. In size it is twice as large as the six New England states combined, and about the same size as the British Isles. For administrative purposes the state is divided into 27 counties, and these in turn into school districts. In 1910 New Mexico had a total population of 327,301, and a density of population of 2.7 persons per square mile.

Educational History. — When the United States acquired New Mexico in 1848 the people spoke only the Spanish language, and there were few, if any, schools in the territory. The Mexican government had made small annual appropriations for schools in six of the towns, but these grants ceased with the passing of sovereignty. Such schools as were provided for the next decade, at least, were provided by the Catholic Church. In 1859 St. Michael's College, a school established by the Christian Brothers (*q.v.*), was opened in Santa Fé.

The first mention of education by the legislative assembly of the territory is in a memorial to Congress in 1853, asking for a penitentiary, roads to the state, and "the creation and support of public schools throughout the territory." Congress taking no action, the legislature memorialized Congress again in the following year, appealing for adequate assistance in starting a school system. The memorial recites that there are but one or two schools in the territory, and these private; that the reserved sixteenth section lands are of no value; and that there are 25,000 adults in the territory (seven eighths of the population) who cannot read or write. The legislature asked for an annual appropriation, which was not made. The first school law, passed at the session of 1855–1856, provided for schools to be supported by taxation, for county boards of education, schools in each county, compulsory education, and fixed the salaries for teachers. A referendum was allowed in four counties, which later rejected the law by a vote of 5053 to 37. The next year the law itself was repealed by the legislature, and the taxes collected were returned to the people who had paid them. In 1857 the territorial legislature again memorialized Congress, this time asking for a grant of $500,000 to establish a school fund, and offering to pledge the school lands as collateral security, but again without avail. In 1860 a new "Act providing means for the education of children" was passed. This law required the justices of the peace of each plaza to act *ex officio* as school trustees, to employ teachers, and to provide a six-months' term of school, and also provided for salaries, compulsory education, and free schools. Very few, if any, schools seem to have been organized under this law. In 1863 an *ex officio* Territorial Board of Education was created, with the Bishop of New Mexico as one member, with authority to make rules and regulations and to require schools to be established in each county. The Governor was also to appoint a Territorial Superintendent of Schools, to supervise the schools, and to report to the Territorial Board and to the Governor. The Territorial treasurer was made custodian of all school monies. In 1863 another memorial, asking for money to establish schools, was sent to Congress with a statement that 60 per cent of the people could not read or write, and that "there is not a public common school in the Territory." This and subsequent memorials met the same fate as the preceding. In 1867 a new law made the probate judges *ex officio* county superintendents of schools, and the justices of the peace *ex officio* school superintendents of their election precincts, each of which was constituted a school district. Two persons in each county were to be appointed to solicit subscriptions from the wealthy, and all fines for the violation of the school law were to be used for schools.

In 1872 laws which really first organized the school system were passed. By these a state tax of $\frac{1}{4}$ of 1 per cent was levied for school purposes, — the first taxation for education, — and a poll tax for schools was specified. It was further provided that if any county had a surplus of $500 or more in its treasury, after paying all current expenses, the surplus should be used for schools. A board of supervisors and directors of schools was to be elected in each county, and they, together with the probate judge, were to have the establishment and management of the schools of the county. A number of counties took advantage of this law, and proceeded to the organization of public schools. In 1874 the law was amended to require the making of full annual reports by the county boards to the Territorial Superintendent; to provide for the election of school officers; and the Territorial Superintendent of Public Schools was also designated as *ex officio* Territorial Librarian at a salary of $150 a year. In 1876 a number of fines were designated to be used for the support of schools. By 1875 reports show that there were 138 schools in the territory, with 147 teachers employed. Most of the schools were still for boys only, and were in part religious schools. A bill providing for a nonsectarian school system was considered, but defeated in 1875. The above legislation practically established the public school system in the territory, and no further legislation of any importance occurred until 1884.

In 1884 the old laws were repealed, and a new school law was enacted creating the school district in place of the election precinct, and establishing the district system of management. County superintendencies were created, and the school studies specified. In this condition the educational organization remained until 1891. In 1891 a new school law was passed, which not only inaugurated the present school system, but may be said to have created a real school system for the first time. Previous to 1891 "there were not 50 public schools in the territory under the control of competent teachers, and in which the English language was taught," while in 1893 the Superintendent reports 519 such schools. Church schools and academies supplied much of the instruction. The New-West Educational Commission also did valuable work in providing schools, both before and for some time after the territory really began the work of education. By the law of 1891 a new Territorial Board of Education was created, and a new Territorial Superintendent of Public Instruction superseded the old Territorial Superintendent of Schools. Instruction in English was made obligatory, and all teachers were required to hold county teachers' certificates, obtained on examination before a county board of examiners. In addition, the College of Agriculture and Mechanical Arts was established in 1888; the University of New Mexico, and the New Mexico School of Mines were established in 1889; the State Deaf and Dumb Asylum in 1891; two state normal schools in 1893; and the State Military Institute in 1895. In 1893 teachers' institutes and in 1897 territorial normal institutes were authorized. In 1897 the annual appointment of indigent students to the state institutions was begun.

In 1901 the legislature further revised and amended the school laws. The Territorial Board of Education was enlarged; the preparation of all questions for the examination of teachers in the territory was given to the Board; the attendance of teachers on county institutes was made compulsory; teachers in districts where Spanish is spoken were required to be able to speak both Spanish and English; distinctions based on race or nationality were forbidden; vaccination was required; and increased taxation was provided. Between 1901 and 1909 a large amount of minor legislation was enacted, but little that changed the form of administration. A Spanish-American normal school, for the education of Spanish-speaking young men and women as teachers, was also established in 1909. As the state had been expecting statehood for some time, but little educational legislation was enacted during the last few years under the territorial government.

Territorial School System. — The territorial school system as it existed at the close of the territorial period, in 1911, was as follows: There was a Territorial Board of Education, consisting of the Governor and the Superintendent of Public Instruction, as president and secretary respectively, *ex officio*, and seven additional members, appointed by the Governor. Five of the seven were to be selected from the heads of the territorial educational institutions, the president of St. Michael's College of Santa Fé, and the city superintendents of the four largest cities in the territory. One other member was to be a county superintendent of schools. The remaining member was not to be a teacher. This Board apportioned the territorial school fund; specified the duties of county superintendents; prepared all questions for the examination of teachers; selected the uniform textbooks for the schools; and had control of the county institutes. The Territorial Superintendent of Public Instruction was appointed by the Governor, with the consent of the council, for two-year terms. He visited the various counties in the interest of education; conducted teachers' institutes; outlined the courses of study for the territory; and acted as secretary of the Board of Education. His salary was $3000 per year.

For each county there was a county superintendent of schools, elected by the people for two-year terms. His salary was based on a combination of the number of schoolrooms in session for at least three months each year, and upon the amount collected in his county from the three-mill territorial tax, but with a maximum of $1200 per year. He had charge of the interests of education in his county; apportioned the school fund to the school districts of his county; visited the schools; and looked after the enforcement of the school laws. For each school district there were three school directors, one elected each year for a three-year term. It was their duty to care for the school property of the district, to provide teachers, and to perform the common duties of a school trustee. Cities and towns were permitted to organize as such and to elect boards of education of two from each ward, who were to organize, supervise, and maintain a graded system of schools, and levy needed special taxes for maintaining the same.

The Enabling Act. — In 1898 Congress granted the territory the 16th and 32d sections, and 500,000 acres of land for its public institutions, and in 1908 further granted the right to locate indemnity lands. By 1908 one fourth of these lands were under lease, and beginning to bring in some income for the support of public schools. In 1910 Congress passed an Enabling Act for the admission of New Mexico as a state, and granted to the state sections 2, 16, 32, and 36 in each congressional township, as a permanent endowment fund for common schools, — a total of 8,618,736 acres. Lands in eastern New Mexico were not to be sold for less than $5 per acre, in western New Mexico for less than $3 per acre, and lands capable of irrigation for less than $25 per acre. The 5-per-cent fund (see NATIONAL GOVERNMENT AND EDUCATION) was also given for common schools; 1,160,000 acres additional were also given to the state for the endowment of its higher educational institutions, and for public and charitable purposes, and on the same conditions. A permanent common school fund of from thirty-five to forty-five millions of dollars should eventually be built up from these grants, and from twelve to fifteen millions additional from the grants for higher educational institutions.

A state constitution was framed by a constitutional convention in 1910, and ratified by the people in 1911. The educational system provided for the new state in this constitution does not differ materially from the territorial school system. Women are eligible for school offices and may vote at school elections on the same terms as men, unless a majority of the voters file a protest in writing. A uniform system of public schools, sufficient for and open to all children of school age, must be established and maintained and a five-month school term is made mandatory for all schools. Textbooks are to be uniform throughout the state, and not to be changed oftener than once in six years. The permanent school fund is specified, state and local taxation are permitted, and the income from the permanent school fund and from taxation is to be apportioned to the school districts on school census. A sufficient reserve fund is, however, to be withheld to provide all school districts levying the maximum local tax sufficient funds to provide the required five-month term of school. State educational institutions of all kinds must forever remain under the exclusive control of the state, and no school funds may ever be used in aid of any sectarian, denominational, or private school. A compulsory education law and a child labor law are to be enacted by the legislature. A State Board of Education, of seven members, is to have the control, direction, and management of all public schools, under such regulations as may be provided by law. The Governor and State Superintendent are to be *ex officio* members, and the other five are to be appointed by the Governor, with the consent of the Senate. Of the five one must be the head of some state educational institution, one a county superintendent, and a third a person engaged in educational work. Other school officers, subordinate to the State Board of Education, and either the district or other form of organization, are to be provided for by the legislature. Normal schools are made mandatory. No religious test is ever to be required of any teacher or student in any public school or state institution. Children of Spanish descent are never to be denied admission to any public school or educational institution, or to be classified in separate schools. All territorial educational institutions previously established are confirmed as state institutions, and for each a bipartisan Board of five Regents is to be appointed by the Governor. A state department of agriculture, under the control of the Regents of the College of Agriculture and Mechanical Arts, is to be created. All school section lands, not contiguous to other state lands, are not to be sold within ten years for less than $10 an acre.

Educational Conditions. — Considering the difficulties under which the new state has labored, the schools maintained are very good. The seven incorporated cities and thirteen additional towns maintain schools which will compare favorably with those in other parts of the country. Eighty-five and eight tenths per cent of the population live in country districts, and in these reasonably good schools are provided. The state has a large number of persons of Indian and Mexican birth, or descent, and these greatly complicate the educational problem. An effort is being made to require that all normal-trained teachers are able to speak Spanish, and the ability to speak both Spanish and English is required by law for many districts. The school laws and a guidebook for school directors are still printed in Spanish, as well as in English, editions. Two Indian mission and twelve Government Indian schools were maintained in the territory in 1910. With the development of the public schools, both the Protestant and Catholic Indian schools have decreased much in numbers and in importance, although twenty such schools were still maintained in 1910 by five different denominations. High schools are being developed in the towns and cities, there being eleven four-year high schools and seven shorter-course schools in 1910, as against six and two nine years before.

Teachers and Training. — About 1600 teachers are required at present for the different public schools of the territory. A state professional certificate is held by 6 per cent of the teachers, while the remainder hold one of the three grades of county certificates, or are teaching on permits. For the training of future teachers the state maintains three state normal schools at Silver City, Las Vegas, and El Rito, but both the attendance and number of graduates of these schools are small. A teachers' institute of at least two weeks' duration must be held by county superintendents annually, and all instructors must hold certificates granted by the Territorial Board of Education.

Higher and Special Education. — The state maintains the following higher and special educational institutions: University of New Mexico at Albuquerque; the New Mexico College of Agriculture and Mechanical Arts at Mesilla Park; the New Mexico School of Mines at Socorro; the New Mexico Military Institute, a boarding school of secondary grade, at Roswell; the New Mexico Asylum for the Deaf and Dumb at Santa Fé; the New Mexico Institution for the Blind at Alamogordo; the New Mexico Orphan Childrens' Home at Belen; the New Mexico Orphans' Home and Industrial School at Santa Fé; and the New Mexico Reform School at Springer. There are no private or denominational institutions of collegiate rank in the state.

E. P. C.

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NEW MEXICO, UNIVERSITY OF, ALBUQUERQUE, MEX. — Established by an act of the Legislature. The first department organized was a normal school which opened in 1892. In the same year the preparatory school was opened and the commercial school added in 1893. The Hadley Laboratory was erected in 1899. The university at present consists of a college of letters and arts, a college of science and engineering, a commercial school, a school of education, a school of music, a sub-freshman division and the summer school. The plant consists of seven buildings. Owing to the extremely favorable situation of the university, many students have come from time to time from distant states and countries.

The university received a grant of 11,000 acres of public land and the grant of the saline lands of the territory for university purposes. By the enabling Act of 1911, a further grant of 200,000 acres was made to the institution and the saline grant was withdrawn from entry. The present appropriation granted by the territory to the university is $32,000. The institution is coeducational, the number of students of each sex being about the same. The registration for 1910–1911 was 137.

E. M. G.

NEW ORLEANS EXPOSITION. — See International Congresses of Education.

NEW ORLEANS UNIVERSITY, NEW ORLEANS, LA. — An institution founded in 1872 for the education of the colored youth. It is under the auspices of the Methodist Episcopal church and is one of the twenty-two schools maintained by the Freedman's Aid Society of the church. In 1878 the first class was graduated from the College of Liberal Arts. The number completing this course has been small. In 1887 the first class was graduated from the professional teachers' course. From the beginning this has supplied a great need, for the demand for trained teachers is practically unlimited. In 1889 the medical college was opened, and schools of pharmacy and nurse training are now maintained. In 1898 a hospital in connection with the professional schools was opened. Classes in Biblical instruction have been maintained with more or less permanency since 1890. The University now owns property worth $150,000 and has an enrollment of between five and six hundred pupils. Its curriculum embraces the entire range of studies from the grades up through the normal, college preparatory, and college courses, in addition to the professional courses above mentioned.

C. M. M.

NEW SCHOOLS. — A term applied to a series of schools which have been established within the last twenty years in many European countries and are organized so far as possible in accordance with results of recent studies in child life. They all are characterized by great freedom from the national administrative authorities, by greater attention to the individuality of pupils, and by their location in the country, they are close to nature. Among these schools may be mentioned Abbotsholme and Bedales (*qq.v.*) in England, *École des Roches* (*q.v.*) in France, and the *Deutsche Landerziehungsheime* (*q.v.*), established originally in Germany by Dr. Lietz and now copied in Switzerland, Russia, and Denmark.

See also Boarding Schools; Experimental Schools.

References: —

See the references given under the articles of which mention is made above.

NEW SOUTH WALES, EDUCATION IN. — See Australia, Education in.

NEW TESTAMENT, PEDAGOGY OF THE. — It would be idle to seek in the New

Testament a technical pedagogy, although it is doubtful whether any literature of similar origin and character recognizes more practically the importance of instruction. The new religion of Christianity was educational in that it strove to socialize ideals of conduct and to train the Christian communities in the significance of these ideals. This general educational tendency is apparent in the New Testament, the most important literary fruit of the life of the churches.

Education in New Testament Times. — This is treated in detail in the article on JEWISH EDUCATION. It is enough to recall the following points: (*a*) By the time the New Testament books were written there were Jewish schools throughout Palestine either in connection with the synagogues or independent therefrom (cf. Josephus, *Ag. Ap.* 2 : 16). Whether or not these schools existed in the smaller towns or in fact in any of the towns outside of Jerusalem during the lifetime of Jesus himself is uncertain, but that Jewish youths received formal training in their national laws and customs is plain from the statements of Josephus and from references in the Mishnah. (*b*) In the Hellenistic world educational methods were well developed, though higher forms of instruction were largely in the hands of independent philosophers like Epictetus. (*c*) The age was not without a general pedagogical philosophy, as is clear from our knowledge of the Greek and Roman literature (cf. Plato's *Republic*) as well as from the writings of Justin Martyr and other early Christian authors. (*d*) Memoriter methods were highly developed. This fact is characteristic of all periods in which textbooks are not readily available. Oriental training emphasizes verbal memory and extended compositions are preserved unwritten by the students of successive generations. The Jewish scholars furnished no exception to this rule, the Mishnah, for example, not being reduced to writing for centuries. This habit enabled the early church to preserve the memorabilia of Jesus in a quasi-systematic way for approximately a generation before they were reduced to writing and the various streams of tradition were combined into our present gospels.

The Method of Jesus. — Jesus has universally been regarded as one of the world's great teachers, but such an estimate has been based on the substance rather than upon the methods of his instruction. It would be incorrect to think of Jesus as a teacher in the sense of a schoolmaster who gave systematized instruction in the elements of culture. He was more of a preacher and conversationalist than a teacher, and his teaching was exclusively ethical and religious. Thus he would naturally be classed with the rabbi and the itinerant philosopher. Unlike Paul, however, he seems never to have received definite rabbinical training (cf. Jn. 7 : 15). The fact that by occupation he was an artisan, very probably a carpenter (cf. Mk. 6 : 3), did not detract from his dignity as a teacher, for all the rabbis had some trade. That he was not uneducated is to be inferred from the fact that he was able to read the Hebrew Scriptures (Lk. 4 : 17–20), although Hebrew was no longer the current language. It is further significant that, so far as we have any record, there was no opposition to his being called " Rabbi," although in his case the term may have been little more than a polite term of address.

Beyond these general conclusions, however, particularly regarding the chronology and language of his sayings, it is impossible to speak with absolute precision. Painstaking criticism alone will enable us to allow for the apostolic reworking of Jesus' teaching, and even after the most methodical handling, we find ourselves still facing questions of details. Yet thanks to modern scholarship we are able to reproduce with great probability his teaching as a whole and to estimate the methods which Jesus as an instinctive and natural teacher adopted. In general his methods were those of other moral teachers of Judaism, although he differed widely from them in technique and spirit. In his method — or more truly, his manner of teaching — we can discern the following characteristics: —

His teaching was occasional and conversational rather then formal and systematic. — The Sermon on the Mount as at present arranged in both Matthew and Luke has, it is true, a considerable unity of structure, particularly in its Matthean form. It may be questioned, however, whether this unity is due to the compiler of his sayings or to Jesus himself. Probably a middle view is preferable, to the effect that Jesus at some time set forth in orderly fashion his position on certain points of Jewish ethics and that gradually other sayings of his were nucleated about this material into what appears now as a considerable discourse. But the arrangement of the sayings of Jesus was certainly very unlike the discussions attributed by Plato to Socrates. Even less were they the product of a literary process. To a considerable extent they were the outgrowth of controversy and generally were the apparently unpremeditated expression of his convictions regarding definite matters proposed to him by either friend or enemy. Yet it would be unfair to say that, while his teachings were thus occasional rather than systematized, they lack unity either in point of view or in substance. Their spontaneity and almost anecdotal quality give them much of their charm and efficiency without detracting from the unity of impression due to their radiating from a central conviction. However various the circumstances which occasioned their utterance, the sayings of Jesus are astonishingly easy to group schematically, for his thought was lucid and consistent. The repetition of important truths not only was necessitated by this occasional method, but serves to give the student the perspective of his thought, at least as it appeared to his immediate hearers, for repetition is one of the most common modes of emphasis in earnest instruction.

His teaching was analogical and poetic rather than literal and scientific. — Speaking generally, Jesus has left us no sayings dealing with the world of nature except as illustrative of moral and religious truths. His central positions are expressed more literally than are their amplifications, but his method is not that of scientific exposition. Compare only his teaching as to virtue with that of Aristotle's *Ethics*. Judaism had developed a literary form of power and beauty in its Widsom literature. This equivalent of the Greek poetical composition had a definiteness of structure marked by parallelism and strophic arrangement. Such teaching was highly figurative as well as epigrammatic and may be illustrated by the sayings of Jesus concerning the supremacy of the eternal life over all physical goods (Mk. 9 : 47 sq.). The use of this literary form was in thorough accord with the anti-legalistic, inspiring spirit of Jesus himself.

Another type of such analogical teaching is the parable. Such a form was not unknown to the rabbis, but in its use by Jesus it reached an incomparable literary beauty. As a pedagogical device a parable is a story of facts, judged to be real or at least not impossible by the speaker and hearers, which is used to enforce or illustrate a spiritual truth. It is generally introduced by some word of comparison such as " like." This form of teaching is of particular value in bringing unaccustomed truths home to men in that it appeals at once to their experiences. It further serves, as Jesus himself seems to say (Mk. 4 : 11), to lodge a truth in the mind of one's auditors even before it is fully understood. The analogy is thus made germinal conviction,— and its use thus appears an element of a consciously adopted method of teaching. This method of instruction Jesus seems to have used almost exclusively during the few months of relatively peaceful instruction after the Galileans began to regard him with favor, and while he was beginning to unfold his constructive ideals.

Other forms of his analogical teaching are similes and the apocalyptic imagery of his day. On this latter point it is not necessary to dwell as criticism shows that Jesus used the form only rarely, and then as a point of contact with his Jewish hearers.

His teaching was progressive and to some extent cumulative. — If one will compare the teachings of Jesus as he took up his work with those which he uttered in the latter part of his ministry, it will be apparent that he passed from the heralding of the message that the Kingdom of God was immediately to come to the less dramatic exposition of the bearing of his central position of God's Fatherhood upon social relations as well as of the indispensable virtues of love and forgiveness. In this transition a genuine progress can be seen from the appeal to the preconceptions of his unlettered audience to the inculcation of his characteristic positions. Its justification in large measure lay in the fact that he had gathered about him a group of disciples who were increasingly sympathetic with his own aims, and, despite the persistence of their earlier naïve expectations, were ready to accept his teachings as authoritative. In the fourth Gospel (Jn. 16 : 12) we have preserved a distinct tradition of a saying of Jesus to the effect that he had practiced self-restraint in his teaching and that he must leave the completion of his instruction to the work of the Holy Spirit in the hearts of his disciples. Such progress made possible the most valuable of the contributions of Jesus to religious thought. He might have left others, if only the disciples had been capable of abandoning more completely their inherited prejudices. In a number of instances Jesus speaks of the disciples' slowness and dullness shown in grasping his real meaning. Like any other teacher, Jesus found himself handicapped by the incapacity of those whom he instructed: *e.g.* by the fear of his own disciples to ask questions concerning even so vital a matter as his announcement of his approaching death. Thanks to this timidity on the part of his disciples, the world has never known precisely how Jesus himself interpreted his death.

His teaching was conditioned by the degree of intimacy which existed between Him and those whom He instructed. — On the outside of his circle of friends were the Pharisees. To them Jesus stood in unalterable and fundamental hostility. He never undertook to instruct them. On the contrary, in order to exhibit distinctly the difference between their legalism and his own belief in religious freedom, he criticized them mercilessly and endeavored to make himself a friend of those who were morally discontented. But within the circle of his friends there were successive grades of intimacy and a consequent scale of more advanced instruction. Jesus, like the Jewish teachers, drew about him a group of disciples. To those " who were without " his instruction was given in parable, both for the protection of himself and his cause and for the advantage of the disciples themselves. To these latter were given explanations of his parables in order that they might know the " mystery of the Kingdom of God." How far this esoteric teaching of Jesus, which is the heart of the gospel, was shared by others than his immediate disciples is of course difficult to say. Yet just as the influence of Judaism extended far beyond the synagogue, and many

Greeks who had not accepted it as a cult were affected by its religious teachings, it is not improbable that his influence was much more widespread than even his popularity among the masses might argue. Origen (*Ag. Celsus* 1:22, 31; 12:21; cf. 1:7, 12, 24, 25, 29) speaks of the two sorts of teaching given by Jesus but leaves us in doubt as to whether he is speaking as an historian or as a commentator.

The Teaching of Jesus was Pragmatic. — Starting with the experiences of those to whom he spoke, whether those of the farmer, the fisherman, the shepherd, or the housewife, he helped them recognize the essential unity of life in the natural and spiritual realms. Jesus thus grounded authority ultimately in the reality of experience. By virtue of his own experience he assumed a highly authoritative attitude and seldom argued as to the truth of his teachings. They were rather to be subjected to the test of practical value. The evidence of their truth lay in the peace and joy which their acceptance brought, just as evidence of genuine discipleship lay in a willingness "to do the things he commanded." In this connection also should be noted Jesus' habit of adducing principles from concrete events — an element of method to be expected in one whose teaching was so vivid and vital as his. He does not, however, generalize so much as interpret the episodes he thus uses.

Jesus' Polemical Teaching. — Such teaching is by no means infrequent in the gospel records and may be fairly said to constitute an essential phase of method. The attitude of Jesus was one of criticism of the highly technical and legalistic religion which had grown up about the Law and the Temple. It is not difficult, however, to find in his polemic the constant endeavor to recall those whom he addressed to the finality of the spiritual values of their faith. That in the case of the ecclesiastics he failed is not surprising, but his failure was a means by which thousands of men and women have been brought into the larger freedom of the spirit which legalism of any sort tends to crush. If, indeed, Jesus were a critic of existing institutions and beliefs, he was also able to substitute for that which he destroyed a new group of truths which should lead their possessors into an enriched spiritual life.

The Method of the Apostles. — The problems which confronted the apostles were in many ways different from those which confronted Jesus. Jesus never organized his followers into a precisely defined group. After his death, however, his disciples immediately undertook the work of propaganda, and like their master were forced to face abuse and suffering. Yet they were able to carry the power of the gospel into the most ordinary affairs of their individual life. In so doing they organized those who accepted their preaching into little groups of men and women, — the primitive churches. With the rise of such institutions, many of them on heathen soil, there was need of a more definite instruction, first as regards the gospel, second as regards Jesus, and third as regards the Christian life. The teacher thus was differentiated from the evangelist.

Instruction given converts to the new faith was in two fields: (1) The facts of Jesus' life and teaching. The Christians who had never seen Jesus especially needed such instruction. The evangelist or apostle who brought to them the message of salvation through him doubtless gave a certain amount of information concerning his life in Galilee and particularly concerning his death and resurrection. This seems to have been the message Paul himself uttered when he first came to Corinth. The gospel which he delivered was the one which he had himself received and it dealt with the historic facts of Jesus' life as well as the implication of these facts (1 Cor. 15 : 1–7). At this point it is true one enters a much debated field, but it would seem possible, if not probable, that the "minister" Mark whom Paul and Barnabas took with them on their first missionary journey had for his duty the instruction of these early converts in the facts of Jesus' life. The fact that his name was attached to a gospel containing just the sort of information which the new convert needed argues strongly that it is a fair sample of the sort of material used for the purposes of instruction by those who, unlike the apostles and the evangelists, devoted themselves to the painstaking and minute instruction of the new converts in the facts which justified their faith (cf. Lk. 1 : 1–4).

(2) The bearing of the Christian hope of a new age and the Kingdom of God upon conduct. The early Christians believed that they were waiting for the appearance of a great spiritual kingdom which would emerge out of the sky and would receive them into itself. They were, therefore, not interested in the reforming of society. They had, however, to live in the midst of heathen surroundings; and this was a task of no small magnitude. Paulinism from certain angles might be described as the application of the Gospel to human affairs. Paul's letters face the perennial difficulty of bringing home to men and women hardly free from the control of heathenism the Christian ideals of family and other forms of social life. His instruction is not formal, but consists largely of treatment of specific problems such as marriage, business slavery, the personal appearance and habits of men and women, etc., from the new point of view. In the course of time there developed what was known as the Apostles' Teaching and this became more or less systematized in the *Didache*, but it would certainly be a very serious error to think of the work of the apostles

as in any sense that of University Extension lecturers on the science of ethics. They were rather ecclesiastical statesmen engaged in organizing communities and instructing them as to the practical duties of everyday life now revolutionized by the supremacy of eschatological and " spiritual " values.

The apostolic teaching was both deductive and affected by the habits of thought of the time. Paul, in particular, proceeded with considerable logical severity from the general position which faith in Jesus as Christ involved. The Messianic program which Jesus was expected to fulfil upon his return from Heaven, carried with it certain implications relative to social life. This belief in the speedy return of their Messiah became less a source of moral renovation than of conservatism. The institutions and interests of the present historical order were soon to come to an end, and in consequence were to be endured rather than transformed. Consequently the teaching of Pauline and later New Testament literature is essentially unsocial so far as the nonreligious relations in life are concerned.

To justify, *e.g.* the subjection of women, the maintenance of slavery, and the submission to government, the apostle makes use of the methods of exposition of his day as they existed among the rabbinical teachers. Certain parallels, it is true, may be found between his thought and that of Stoicism, but they are hardly more than the expression of general principles which all ethical thought has recognized. It is impossible to find in his letters any controlling influence of such university training as he may have obtained in Tarsus. On the contrary, Paul manifests a decided hostility towards philosophy, insisting that the " wisdom of this world " is foolishness in the eyes of God and that he has a spiritual wisdom, " not of this world," which he can share with the perfect. Just what this wisdom really was his letters do not enable us to say, but it may be surmised that it was allegorical interpretation similar to that which he occasionally used.

Under the influence of his rabbinical training Paul does not hesitate to argue in a way all but unintelligible to persons trained in Greek methods of thought. Such methods are to be seen in controversies with Jewish opponents as in Gal. 3 : 15–22; 4: 21–31. In similar accord with his teachers is his constant use of the Old Testament. As the authoritative oracles of God, the Old Testament literature was to Paul, and indeed to all the early church writers, a court of appeal as truly as to the rabbis. Quotations from the Scriptures are often arbitrary, the sentences being detached from the context; but the early Christians who thus were under the influence of contemporary theological methods seem never to have doubted the value of the method and in some cases approved what we must believe were the even more pronouncedly Alexandrian methods of Apollos, who is said to have been " mighty in the Scriptures."

Occasional lack of proportion both in the treatment and method of Paul is accounted for by the fact that most of the teaching was the outgrowth of definite problems and sometimes definite questions. Occasionally he recurs to the teaching which he himself had received, but this itself was probably not very systematic. As an Apostle he claimed original authority in that he had not been instructed by the original Twelve and in that his gospel came to him directly by the revelation of the Christ. The letter to the Romans is the most systematized and academic of his writings which have survived, but it is an oratorical treatise rather than a pedagogical exposition. In it the characteristics already mentioned appear, though less pronouncedly than in Galatians. Most of his extant writings, however, are composed of independent treatments of specific problems, such as marriage, the resurrection, the position of women, justification by faith, current philosophies, and gifts of the Spirit. In them it is possible to discover that germinal system of thought which the theologians have made the vertebral column of the Christian system, but there is little of strictly pedagogical method. The nearest approach to the recognition of pedagogical principles is apparently to be seen in his refusal to give his advanced views to those who, like the Corinthians, were prepared only for the " milk " of his teaching.

This recognition of the need of progress in Christian thought becomes more apparent in the later New Testament books, such as the *Epistle to the Ephesians* and the *Letter to the Hebrews.* In the latter book the unknown author distinctly states that he intends to proceed from the " elements " of the Christian system to "perfection," *i.e.* to a sort of Christian gnosis. But the other New Testament books are religious tracts rather than educational treatises, and show no marked variation from the method of the preacher as distinguished from that of the teacher. In them all there is an exclusion of philosophical and revolutionary doctrines, an inculcation of patience pending the " day of the Lord," encouragement to maintain the hope of the approaching glorious deliverance, and exhortation to be among those who were to share in the triumphs of the returning Christ.

The Beginning of the Organization of Education. — In the New Testament, however, there are hints of more systematic instructional methods than the practical doctrinal exposition of the apostle would seem to indicate. Christianity is as much a creature of an institution as of a group of doctrines. In fact, it may fairly be said that its practices have generally preceded its doctrinal formulations.

(*a*) *Teaching and Prophesying.*— While we find in Paul no organized system of Christian instruction we do find references to the "gifts" of teaching and prophesying. At this distance it is impossible to discover with absolute precision just what these "gifts" were, but the term at least indicates a differentiation of function due to abilities which were attributed to the inworking of the spirit of God. The teachers undoubtedly were those who had the ability to set forth the supportable implications of Christian hope in some more or less systematic fashion. The prophets seem to have had the capacity to set forth something similar, but doubtless with less reliance upon logic and more trust in the inspiration of the moment. Paul distinguishes both functions sharply from that of the "gift" of "tongues," which he regards as not intended for "edification." In the words of the new prophets there lay the possibilities of convincing the minds of the non-believers. In the work of the teachers, there lay means of supplementing the practical instruction which Paul himself gave in his letters.

(*b*) *A professional Teaching Body.* — The development of the church further tended to differentiate a group of people whose business it was to teach in spiritual matters. These Paul announced were worthy of being paid. Such persons were evidently not priests but doubtless resembled the synagogue preacher and the modern pastor. How far their instruction went and how early they became a distinct class it is now impossible to say, but that there was some instruction in Christian facts and doctrine of a formal sort seems to be evident from Galatians 6 : 6, and particularly from Luke 1 : 4, in which Theophilus is said by Luke to have been instructed (catechized). Reference has already been made to the possibility that Mark may have belonged to a class of church workers called the "ministers of the word," but there remains a great obscurity as to the exact meaning of the title. By the beginning of the second century it is clear that instruction was already pretty general in the churches. To the need of such instruction is doubtless to be attributed the reduction to writing of the traditions carried *memoriter*. Variations in the synoptic gospels may fairly well be accounted for by the assumption that they represent the types of such instruction given in different parts of the Roman Empire. With the reduction of the oral traditions of Jesus to writing (a process which was doubtless in the main complete before the destruction of Jerusalem in 70 A.D.), the possibility of genuinely catechetical instruction was established and such instruction may be assumed to have begun. We have, however, no conclusive evidence of any particular instruction of the young in Christian doctrine.

Summary. — The pedagogical methods of the New Testament, in so far as they are anything other than those of practical counsels, may be said to have been empirically well adapted to conditions. Their subject matter was not general biblical or scientific information, but rather practical directions for living; as such they utilized the experiences of both teacher and those taught and set forth the principles of the New Christian idealism in accordance with current methods of thinking but without formal institutions or methods for instruction. The extraordinary success of the new faith must be accounted for not so much by any novelty in its pedagogical methods as by the applicability of its tenets to the Græco-Roman world. S. M.

See CATECHETICAL SCHOOLS; CATECHUMENAL SCHOOLS; CHRISTIAN EDUCATION AND THE EARLY CHURCH; JEWISH EDUCATION.

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NEW YORK, CITY OF. — The present city of Greater New York, as formed by consolidation in 1897, includes the borough of Manhattan, or New York proper; the borough of the Bronx, to the north and east of Manhattan; the borough of Brooklyn, formerly the independent city of Brooklyn, and itself a consolidation of a number of towns; the borough of Queen's, being a part of Queen's County, on Long Island, and including Flushing, Hempstead, Jamaica, Long Island City, and Newtown; and the borough of Richmond, coterminous with Staten Island, in the lower bay. The combined city has an area of 320 square miles. The population of Greater New York City in 1910 was 4,766,883, or practically the same as for the state of Ohio.

Educational History. — The history of education in the state of New York during the colonial period, both under the Dutch and English rule, has been traced under the history of education in the state of New York. (See NEW YORK, STATE OF.) The first free school in the city after the Revolutionary Period, was opened in 1787 by the Society for Promoting the Manumission of Slaves, with twelve colored pupils in attendance. In 1794 the school was incorporated as the African Free School and a few years later a schoolhouse was built in Cliff Street. By 1797 small grants were made to the school by the city corporation. The first free school for white children, enforcing no religious restrictions, was opened in 1801 by the Association of Women Friends for the Relief of the Poor, organized in 1798 by a group of women connected with the Society of Friends.

The Public School Society. — In 1805 a similar society was organized by a number of philanthropic citizens and chartered by the legislature as the Free School Society of New York, and its powers were extended to include in its educational work "all children who are the proper objects of a gratuitous education." For the next few years the Society received aid and grants from the city and from the state legislature and in 1815 participated in the new State Common School Fund. (See NEW YORK, STATE OF.) By 1826 eight schools, with separate departments for girls in nearly all of them, enrolling 345 pupils, were in operation and gave instruction in reading, writing, figures, and religion (the children attending some place of worship regularly as a condition of admission). The Lancasterian system was employed from 1817 on. In 1818 Lancaster (*q.v.*) lectured under the auspices of the Society, which in 1820 published *A Manual of the Lancasterian System.* But in spite of the progress of the Society, many children were still unprovided for. In 1829 an inquiry, made by the Common Council, showed the following as the status of education in the city: —

SCHOOLS	TEACHERS	PUPILS STUDYING			TOTAL PUPILS
		First Elements	Geog., Gram., Arith.	Higher Branches	
430 Private and Church schools	432	6907	7214	1869	15320
3 Incorporated schools . . .	6	220	841	270	1081
19 Charity schools .	25	2430	960	15	2545
11 Public schools .	21	6007	475	——	6007

As early as 1822 the Society had considered the advisability of organizing instruction in the higher branches for the more promising pupils, but no action was taken toward extending the Society's work until after the reorganization in 1826. The years 1822 to 1824 were marked by the first of the Society's struggles with the religious organizations which for so long had controlled the educational situation in the city. The Society's work was largely cut into by some church-supported Lancasterian schools. The matter was carried to the legislature, and, after a long struggle, the basis of apportionment was changed by giving all of the New York City school money to the Common Council for distribution as they saw fit. The Council, after deliberation, unanimously decided to cut off all church schools from the grants, and the year 1824 thus marks an important step in the establishment of a non-denominational public school system for the city.

In 1826 the Society changed its name by charter from the Free School Society, to The Public School Society of New York, and was authorized to charge tuition fees for instruction, and to grant remittances of fees to those too poor to pay. Large numbers of parents who had previously sent their children to the Society's schools found themselves now "too poor to pay and too proud to confess their poverty." The result was that the schools, which at the beginning of the experiment had enrolled 3457 children, in six months fell off to 2999, two thirds of them being pay pupils. In 1818 the legislature had granted the Society aid from the license money paid by dealers in lottery tickets, and in 1829 a property tax of one eighth of a mill was granted in addition for maintenance. With increasing revenue, it was soon decided to make the schools free to all.

In 1827 the Public School Society organized a "junior department" in School No. 8, with a woman as teacher, for children of three years and upward, and taught on the Lancasterian system. In 1828 the Infant School Society, which had opened its first school in 1827, was permitted to establish its second school in Public School No. 10. In 1829 a report was made to the Board favoring the infant school system of training, and in 1830 the junior department of No. 8 was converted into an infant school. The new designation of primary department was now applied to such schools, and women teachers were decided upon for them. From this time on, the primary departments became an important part of the Society's work. The Society in 1830 had eleven buildings, containing twenty-one schools, and having an attendance of 6178. Two of the schools were infant schools, and three were coeducational. In 1832 the monitorial system was in large part abandoned. A committee on primary schools was appointed by the Society, and it was decided to organize ten such schools, under women teachers, for children four to ten years of age, and after the Boston plan, where the committee had visited and inspected the schools. In 1833 the first free evening schools were established, but they were abandoned a few years later. In 1834 the Manumission Society turned over its buildings and equipment to the Public School Society, and these schools became the African (in 1838 changed to colored) schools of the city. In 1834 also a special Saturday school, for the instruction of the female monitors employed in the primary schools and departments, was established, and in 1835 similar schools for the monitors in the boys' schools were provided. In 1828 the Society had appointed a "visitor" to look after attendance, and, in 1833, the title was changed to "agent" and he was also made a business supervisor for the city. In 1837 the office of superintendent of repairs was created, an office which gradually developed into that of school architect.

Creation of the Board of Education. — In 1842 the first board of education was created as a result of the claim of denominations which desired to share in the school funds of the Society, city, and state. Each of the seventeen wards of the city was created a separate school town, and a board of education, composed of two commissioners for each ward, was to be elected by the people. Each ward was also to elect two inspectors and five trustees to act as a local school board. Existing schools were not disturbed, but public funds could not now be granted to any school or society "in which any religious sectarian doctrine or tenet shall be taught, inculcated, or practiced."

The new Board of Education began operations in 1842, opened its first school in 1843, and by 1848 had twenty ward schools, two primary schools, and two colored schools in operation. The new system was cumbersome, imperfect, and lacked the intelligent direction of the old Public School Society, but made very substantial progress. For some years the two school systems existed side by side, with more or less friction. Under the new system the old monitorial plan of instruction was either greatly restricted or entirely abandoned. The buildings erected by the Board had more and smaller classrooms and more teachers, and this and other popular features of the ward schools, as they were called, gave them a great advantage over those of the Public School Society. In 1848 the right of the Society to build any additional schools was questioned by the Board, and later prohibited by the legislature. This placed the old Society at the mercy of the new Board of Education, and in 1853 the two were consolidated. The Public School Society passed out of existence after forty-eight years of service, turning over to the city school property valued at $604,820.46. During the period of its existence the Society had educated over 600,000 children and more than 1200 teachers. By the terms of the consolidation act, fifteen members of the Society were elected to seats in the Board of Education. The new Board assumed control of a school system consisting of 214 rooms or departments, twenty-one of which were for colored children.

Work of the Board of Education. — The Board of Education from the first began an active campaign to establish schools. During the first ten years of its existence the city increased 60 per cent in population, while the schools increased 120 per cent. In 1847 evening elementary schools were reëstablished, and in 1849 a free academy which in 1866 became the College of the City of New York (*q.v.*). In 1841 a county superintendent of schools, elected by the county board of supervisors, had been created, and in 1851 the legislature granted the Board permission to appoint a city superintendent of schools, one or more assistant superintendents, and a superintendent of school buildings. By 1860 the Board had under its control forty-seven grammar schools for boys, forty-seven grammar schools for girls, eighty-seven primary schools and departments, and eleven colored schools, a total of 192 schools, employing 1548 teachers, and having an average attendance of 55,050 pupils. By 1870 there were 190 schools, 2407 teachers, and an average attendance of 85,307 pupils. The population of the city at this time was 942,292, and the school population about 200,000. In 1866 the evening school system was remodeled, and the first evening high school was established. In 1869 a Female Normal and High School was authorized and established, which, in 1888, was transformed into the City Normal College. In 1869 corporal punishment was prohibited; in 1871 the first law permitting the issue of school bonds was enacted; in 1873 the Nautical School was established; in 1874 the first compulsory education law was passed, and a supervisor of truancy was appointed the following year; in 1884 the separate colored schools were abolished; in 1888 the free public lecture system was established; and in 1887, 1888, and 1890 additional evening high schools were created. The period from 1860 to 1890 has been termed the period of peaceful expansion. Only minor improvements were made during this period, the chief legislation during these three decades relating to the composition of the governing bodies, with the district trustee system as the chief point of issue. In 1871 a Department of Public Instruction, as a branch of the city government, was provided for, with a Board of Education of twelve, all appointed by the mayor. These two laws appear to have been in advance of the public sentiment of the time, and in 1873 they were repealed, and the law of 1864 virtually reënacted. This reëstablished the district boards, and, in part, the district system of school control. The Board of Education of twenty-one members was to be appointed by the mayor, and the Board was in turn to appoint the ward boards of five district trustees each. The Board of Education became a legislative and supervisory body, and the district trustees appointed teachers, looked after the school property, and recommended principals and vice-principals to the central Board for appointment. In this condition the organization of the New York City schools remained until 1896.

The ward system at its best was unsatisfactory as a system, and gave rise to much complaint. In the selection of the boards it was generally believed that religious and racial questions, rather than educational efficiency, were dominant. The schools were criticized as narrow and partial, and were often suspected of proselyting the children who attended them. The criticism rose to such an extent that the legislature directed the mayor to appoint a commission to revise the school organization for the city and to report to the next legislature. The bill proposed failed of enactment at the sessions of 1894, 1895, and 1896, the district trustee system being the center around which the battle was waged. Finally, a substitute bill was adopted which abolished the trustees and created a board of superintendents, the latter to have the power to nominate all principals, vice-principals, and teachers; to recommend the course of study; to manage and supervise the schools; and to examine and license teachers. No change was made in the Board of Education itself or in the manner of its appointment, except to make it more in the nature of a board of trustees, with power to legislate and approve, but with little power to initiate. This law was the most important reform accomplished in the New York City school department in half a century, and, with the district trustees abolished, the way for future progress was at last clear. Nearly all of the important progress in the city school system has been made since this elimination of the district system in 1896.

Brooklyn. — In Brooklyn, as in New Amsterdam, the minister preceded the schoolmaster. Probably the first school on Long Island was provided at Flatbush, in about 1653, though the first regular and full appointment as schoolmaster appears to have been in 1660. The first school tax was levied in 1661 for a school opened in Breucklyn. A third school was opened in 1663 in Bushwick (later reorganized as the first school in Williamsburg), and a fourth school was opened the same year in Bedford. Other schools were first organized in Flatbush in 1675, Gravesend in 1728, and New Lots in 1740. Two other schools were organized at Wallabout Creek and at Gowanus before the Revolution. All of these schools later became a part of the public school system of the city of Brooklyn. The Dutch language was employed at first, but from 1758 up to 1800 both the Dutch and the English language were used. In the Bushwick school Dutch was taught up to about 1835. As late as 1770 the town of Brooklyn contained only one school, with nineteen pupils. In that year a schoolhouse was built by subscription, and the subscribers elected trustees to manage the school and to admit free those unable to pay tuition. It is claimed that the Gowanus school (later Brooklyn No. 2) was organized as a school district under the new State School Law of 1810. In 1815 the first distribution from the State Common School Fund was received, and in 1816 Brooklyn levied a village tax of $2000 to open another school. At that time there were 552 children in the village not attending private or church schools. Six other schools are reported as having been organized in the village before the incorporation of the city of Brooklyn in 1834.

On the organization of the city, the Common Council was given power to organize the schools. This was then done on the district system plan, the Council appointing three trustees for each school in the city, who were in turn to select the teachers and to manage the school. For the city as a whole the Council also appointed three inspectors and three commissioners, by way of integrating and harmonizing the district control. This form of organization continued up to 1843, when the first governing body for the schools of the whole city was created. The Council was created a Board of School Commissioners, with power to appoint two or more persons from each school district, for three-year terms, to constitute, with the mayor and the county superintendent of schools, a city Board of Education. In 1847 the Board of Education was authorized to appoint a Superintendent of schools for the city. In 1854 the city of Williamsburg and the town of Flatbush were consolidated with the city of Brooklyn, and the membership of the Board of Education was increased to forty-five, at which it remained during the rest of its history. In 1862 the mayor was given the power of nomination of members, and in 1882 he was given full power of appointment. In 1873 the schools were organized under the Department of Public Instruction of the city government, and the title of the superintendent was changed accordingly.

Beginning with the organization of the Board of Education in 1843, the important steps in the evolution of the Brooklyn school system may be briefly traced. After several attempts to conduct Saturday normal classes, a teachers' training school was established in 1885, with a one year's course of instruction. The first uniform course of study was prepared in 1866, and remained almost unchanged for twenty-one years. In 1874 the first unification of the grammar school work was made by a provision for uniform examinations for the completion of the grammar schools. In 1876, following the enactment of the first compulsory education law in 1874, a superintendent of truancy and five agents were appointed; in 1878 two attendance schools were provided; and in 1895 a truant school was created by the Board. In 1851 the first evening high school had been established, and in 1880 a second evening high school was provided for. In 1883 a head drawing teacher was appointed; in 1890 a supervisor of drawing and in 1896 a director of sewing and four sewing teachers. In 1897 the first public kindergartens were opened. In 1878 the Central Grammar School, with a two years' course, was opened; in 1887 the course was extended to three years; and in 1890 a four years' classical course was first outlined. In 1891 a Boys' High School and a Girls' High School were evolved out of the Central Grammar School. In 1894 the Manual Training High School was created, and in 1895 the

Erasmus Hall Academy in Flatbush was accepted and transformed into the Erasmus Hall High School. In 1883 the Brooklyn Bridge was opened, and led to the rapid growth of Brooklyn.

From the organization of the city in 1834 the Council had been permitted to appoint boards of school trustees of three to look after and manage each school. In 1851 this was definitely transformed into the " Local Committee System," of three trustees for each school. When high schools and training schools were established, local committees for these were also established, and in time the system grew so formidable that substantial progress under it was very slow, if not almost impossible. The local committee system and the unwieldiness of the large Board of Education were subjects of discussion and criticism for years, and in 1894–1895 efforts were made to secure a more centralized administration and a Board of Education of fifteen members. Before anything was accomplished, however, Brooklyn in 1897 became a part of the city of Greater New York.

Present System. — The Greater New York charter of 1897 provided for the consolidation of the old city of New York, including the Bronx, the city of Brooklyn, a part of the then Queen's County, and all of Richmond County into one greater city organization. The New York and Brooklyn Boards were continued without change, the different town and county school organizations in Richmond County were consolidated under one Board of Education, and the same was done for that part of Queen's County which was annexed. The city superintendents of New York and Brooklyn became borough superintendents, and borough superintendents were to be appointed for Richmond and Queen's. A Central Board of Education of nineteen members was to be constituted, by representation from each of the boroughs. The result was a federation, with no more disturbance of existing conditions than was necessary, and with no great powers lodged with the Central Board. In Brooklyn the local committee system was expressly continued, and this was not abolished until the new Charter of 1901. The Central Board was made the custodian, also, of all school moneys, and was required to appoint a School Treasurer and to establish a disbursing office.

The disadvantages of having four borough school boards and a loosely organized central body were so many that, after four years of trial, the plan was abandoned. In 1901 a revised charter was obtained for the greater city which unified the different parts of the school system for the first time, and with certain minor changes still continues.

The school system as at present organized is directed by a Board of Education of forty-six members, appointed by the mayor. Of these, twenty-two are appointed from the Borough of Manhattan, fourteen from the Borough of Brooklyn, four from the Borough of the Bronx, four from the Borough of Queen's, and two from the Borough of Richmond. An executive committee of fifteen directs much of the work of the Board, and fourteen committees look after various special lines of work. The city is divided by the Board of Education into forty-six school districts, for each of which a board of five citizens is appointed by the borough president. One member of the Board of Education, designated by its president, and the district superintendent of schools having supervision of the district, are also members of each local board. These local district boards are largely advisory in function, but have some important supervisory powers over the school property of the district.

The Board of Education appoints a superintendent of schools for the city, and eight associate superintendents, who together constitute the board of superintendents, and, on their recommendation, the Board appoints the district superintendents, of whom there are twenty-six. The initiative in practically all educational matters is given to this board of superintendents, and its educational powers are large. A board of four examiners has control of the examination and certification of all teachers and principals. The Board of Education appoints a superintendent of lectures, who has charge of the free lecture system (*q.v.*) of the city; a superintendent of libraries, who looks after the libraries and library work in connection with the schools; and a board of retirement, to administer the Teachers' Retirement Law.

The Board of Education is allowed the proceeds of a three-mill tax for salaries, but all other expenses are wholly within the discretion of the Board of Estimate and Apportionment for the City, to whom the Board must apply for funds. The Board of Education possesses by law such general powers as are necessary to establish and control a complex city school system. The city superintendent of schools has a seat in the Board, with the right to speak but not to vote. He is charged with the enforcement of the compulsory education laws, and nominates all attendance officers for appointment. He assigns their duties to his subordinates, and oversees their work. He presides over the board of superintendents and the board of examiners. The board of superintendents nominates all district superintendents, principals, heads of departments, and teachers; selects all textbooks, apparatus, and supplies; nominates the directors of the special branches of instruction, and assigns the assistants to their work; recommends changes in grades, classes, and courses of study; and determines all promotions and transfers of teachers and supervisors, subject to the approval of the Board of Education. The district superintendents are assigned to the supervision of different districts of the city, or to different branches or divisions of the educational work.

Scope of the School System. — In size and complexity the school system of the greater city is virtually a great state school system in a condensed form. The city of New York enrolls a larger number of children, employs four fifths as many teachers, and expends half as much again for education as the state of Ohio. The school census of the city exceeds a million and a half of children; about 800,000 children are in average daily attendance at the public schools; a city college, a large normal school, and branch training schools, twenty-two day high schools and a dozen evening high schools, about two hundred day and about fifty evening elementary schools, trade schools, a system of vacation schools and playgrounds, a nautical school, and an extensive evening lecture system are maintained; about 18,000 teachers, and a thousand supervisory officers are employed; and the current expenses total about thirty-five millions of dollars, and are increasing constantly and rapidly. The College of the City of New York (*q.v.*), located in Manhattan, is one of the large and important colleges of the United States. The city normal school is also a large and an important institution. Training schools are also maintained in Brooklyn and Queen's. The high schools employ about 1500 teachers, and enroll about 40,000 students. They represent different lines of instruction, there being manual training, commercial, and vocational high schools, as well as high schools of the more traditional types. A number of evening high schools of different types are maintained in the different boroughs, the evening vocational or trade schools being of an excellent type.

Educational Conditions. — The greater city has recently made very remarkable endeavors to meet the educational needs of a very complex and difficult educational situation. Most of the important progress has been made since the elimination of the district system, and the inauguration of the present system of school control. Owing to the very rapid growth of the city from births and immigration, the struggle to provide seating accommodations for all has been a long and as yet an unsuccessful one, despite the erection of numbers of excellent new buildings. The buildings erected within the past fifteen years are among the best of their kind. The educational problem is rendered especially difficult by the fact that New York City is one of the most cosmopolitan cities in the world, and hence has large numbers of children of foreign parentage in the schools. Over one third of the total population is foreign born, and about three fourths of the population is of foreign parentage. The Germans, Irish, Italians, Russians, Austrians, and English, in the order given, are the leading foreign nationalities, though almost every foreign nationality and race is represented in the city's population. This, with the congestion of population, the large amount of poverty, and the absence of the wholesome home restraints to which the children of these foreign peoples are accustomed in Europe, makes the educational problem in the city especially difficult. The peculiar conditions call for a centralized educational administration and for a high quality of educational leadership. To cope better with the truancy and child labor situations new legislation of an important kind has recently been obtained, and the metropolitan school census law recently enacted, under which the police make an annual house to house investigation, gives the city of New York the best school census law to be found in the United States. As might naturally be expected in a city where the schools were for so long relatively poor and the public school system incomplete, and in a city possessing so large a foreign element, the private school and the parochial school abound, though these schools have not increased so rapidly since the public schools have come to represent a higher type of public education. E. P. C.

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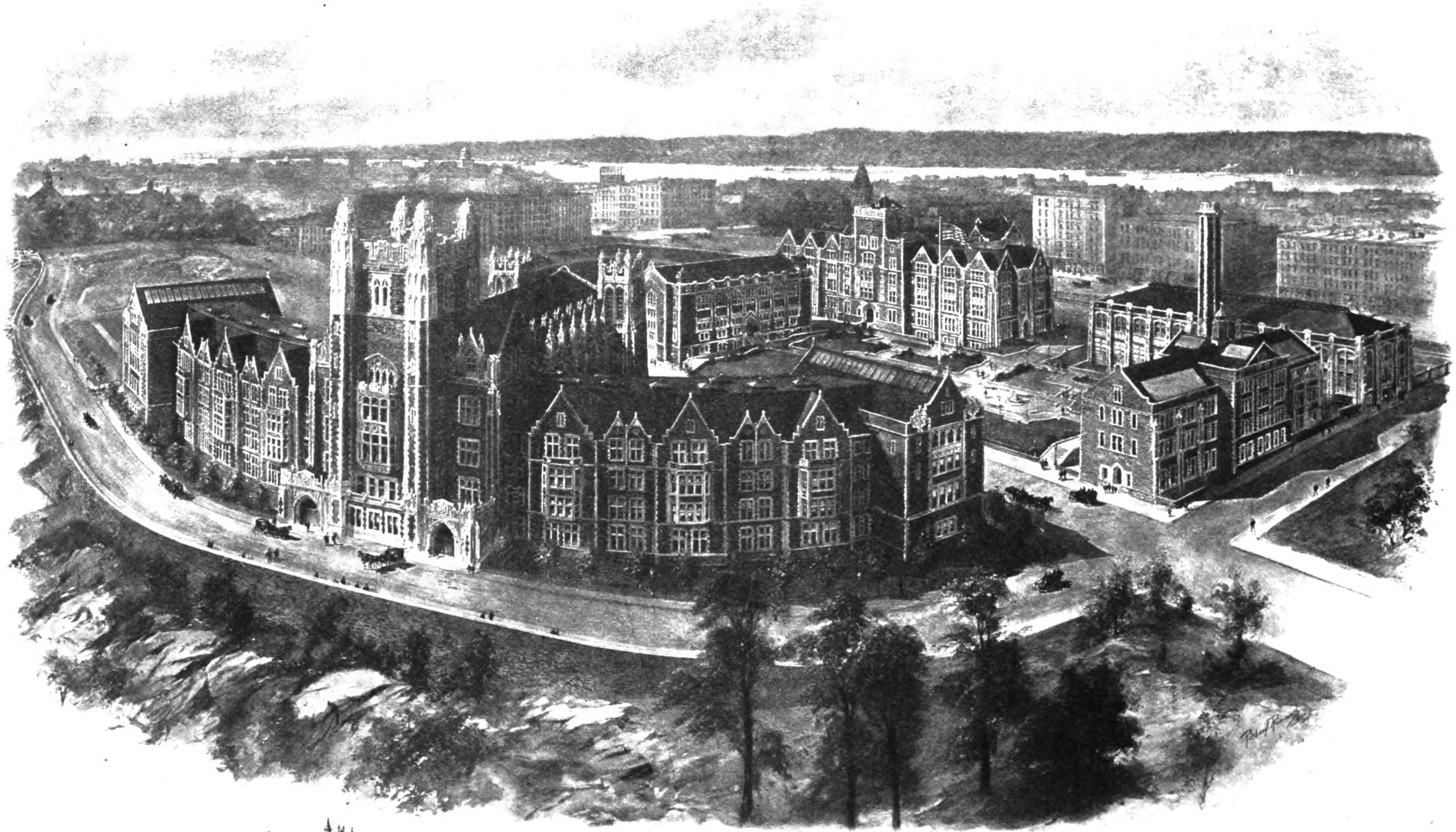
NEW YORK, THE COLLEGE OF THE CITY OF. — The capstone of the free public educational system of New York City. In response to the repeated proposals to found a Latin School or an Academy, a committee was appointed by the legislature of 1846 to study the advisability of such a step. The plan for an institution of higher learning was submitted to the people in the election of 1847 and was carried by an overwhelming vote. The Free Academy opened its doors with 143 students and a faculty of nine, under the leadership of President Horace Webster. The Free Academy was an attempt to evolve an institution that combined both high school and college, and proved most successful. Its students and its faculty gradually increased,



THE COLLEGE OF THE CITY OF NEW YORK

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its standards were steadily raised until it reached the level of the best of the eastern colleges.

In 1866 the name was changed to The College of the City of New York, a title more in keeping with the rank and the scope of its work. Under the direction of its second president, General Alexander S. Webb, the sphere of work of the college increased in such proportions that annexes were built and temporary quarters were hired in adjoining buildings. By the close of the century, the pressure of a rapidly growing student body made it evident that new quarters were imperative. The city provided $5,000,000 for a new home of five buildings on Washington Heights, with an equipment unsurpassed. In 1908 these new structures were given over to a student body of over 4000, including the preparatory classes, an instructing corps of about 230 under the presidency of John Finley. The college not only provides tuition for 1300 college students and over 2500 preparatory students, but also special instruction for over 3000 teachers of the city schools and for 500 evening students, and musical recitals and lectures for the promotion of higher musical interests to tens of thousands. All these activities are carried on through an annual appropriation of about $600,000.

The aim of the college is to enable all ambitious young men, properly prepared, to obtain the cultural advantages of a higher education, to foster in them a civic and social conscience, to develop an ideal citizen body. A free education of college grade is open to all the city's sons, irrespective of race, creed, or class. Unlike the civic universities of England, often placed in the same class, the College collects no fees, makes no charges for books and apparatus, and does not depend upon the bounty or the philanthropy of any private individual. (See MUNICIPAL COLLEGES AND UNIVERSITIES.)

The present organization of the College dates back to 1900. Prior to that year the trustees of the College were also the members of the Board of Education of the city schools. Occupied with the vexing problems in the education of 750,000 children, the Board could not properly direct the policies of this single institution. In 1900 the Legislature gave the College a separate board of nine trustees, who were to be appointed by the Mayor of the City for a definite term. Beneficial results soon followed in the wake of this change, for it brought increased familiarization with the needs of the College, and concentrated effort towards the realization of the cherished plans for a new and fitting home.

The standards of admission are on the same high level as those in the leading eastern colleges. Students are admitted by a certificate of the College Entrance Board, or by a diploma of the city high schools or of Townsend Harris Hall, the Preparatory Department of the College.

The spirit infused by the early authorities reflected their West Point training. The College is still characterized by severe discipline, rigorous mental work, a strict marking system, an emphasis on those subjects that give mental fiber. The classics are studied very intensively, and more mathematics is usually required than by other colleges in the country. The existing curriculum is an attempt to retain the rigor of the old course and rational latitude for personal choice. Six courses are offered: these are grouped under two heads, viz. those leading to the B.A. degree,— classical, Latin-French, modern language; and those to the B.S. degree,— general science, biology-chemistry, mechanical. All work is prescribed through the sophomore year. In the junior and the senior year ample opportunity is given, through electives, for the pursuit of special interests and the cultivation of individual powers. The College was the first to establish a chair in English as well as the first to organize a Department of Mechanic Arts. It was one of the pioneers in the movement to introduce the sciences and place them on a par with the classics. It responded to the pressure of needs of the day by organizing in the last decade departments of public speaking, physical training and hygiene, education, economics and social science, and music.

In addition to the regular college course, the College cares for a Preparatory Department, Townsend Harris Hall, with more than 2500 pupils. In the hope of reaching those worthy young men who through force of circumstances were denied the benefits of a college education, the Evening Sessions were organized in 1910. A freshman class of over 200 enrolled, each meeting the same entrance requirements as those which govern admission to the day sessions. Over 500 evening students are at present pursuing regular studies of college grade, striving either to complete an interrupted course, or merely for personal development. In order to meet the needs of those teachers of the city school system who are endeavoring to improve their professional standing, it offers under its auspices regular courses in education, English, comparative literature, science, etc. Over 3000 teachers are in regular attendance. The successful completion of these courses entitles the teacher to partial exemption in promotion examinations given by the Board of Education of New York City.

The student body is different from that which one finds in the average eastern college. The enormous population of the city furnishes the students. There is no dormitory life. The young men scatter over the city each day when college labors and activities are over. The great majority of these students would be denied a college education if it were not for the opportunity which the College extends to them. Social life and social spirit, however, are not absent. The students form their friendships in one of a large number of literary, debating, or science societies, and in the round of popular fraternities. Though the institution is nonsectarian, it is not irreligious; the Y. M. C. A., Y. M. H. A., the Newman Club, the Menorah Society, keep alive the religious spirit which many students bring to the College.

A municipal college, more than any other, must constantly be alive to its obligations to the community. The College of the city of New York, in its attempt to meet its social responsibility, has given its best graduates to the city school system. In the capacity of teachers, principals, superintendents, supervisors of evening education or of free public lecture centers, those who gained their inspiration at the College are striving in the colossal task of Americanizing the cosmopolitan and foreign population of the city. The College has its full quota of leading members of the New York Bar, of eminent surgeons, of illustrious engineers, of experts in sanitation, of leaders in architecture and in every phase of human endeavor. J. H. F.

NEW YORK SCHOOL JOURNAL. — See JOURNALISM, EDUCATIONAL.

NEW YORK, STATE OF. — First settled by the Dutch in the early part of the seventeenth century; it was surrendered to the English in 1664, and remained under their rule until the Revolution. In 1788 New York entered the Union as one of the thirteen original states. In size, the state is the largest east of Illinois and north of North Carolina. Its area is 47,654 square miles, which is about the same as that of England. The total population in 1910 was 9,113,614, which was greater than that of any other state, and in its density of population, 191.2 per square mile, the state ranks fifth. For administrative purposes the state is divided into sixty-one counties, and these in turn into superintendency districts, cities, towns, and school districts.

Educational History. — *Under the Dutch.* — New Netherlands was founded by the Dutch West India Company as a commercial venture. New Amsterdam (now New York City) was the seat of the government and the principal settlement. By the time of the English occupation about a dozen villages had been settled, principally on western Long Island and along the Hudson River. So far as is known, the first school of the colony was opened at New Amsterdam in 1638 by Adam Roelantsen (the formerly accepted date of 1633 is now considered to be unauthorized). This school, as was the custom in the Netherlands, was a parochial school, the joint concern of the civil authorities (the West India Company) and the Reformed Dutch Church. The former paid the salaries and exercised the principal control; the latter licensed the schoolmasters and exercised a certain supervision over the teaching. The schoolmaster was (generally) also the reader (*voorlezer*) and precentor (*voorsanger*) in the church, and often acted as sexton besides. In addition to his salary from the company he received tuition fees from all the pupils except the poor, who were taught free. In 1653 New Amsterdam received a city charter, and the school came more under the control of the city government. This school appears to have been maintained continuously from its foundation and is now probably the oldest elementary foundation existing in America. The outlying villages for the most part conducted parochial schools similar to that of New Amsterdam. In the case of these, however, the West India Company did not pay the salaries (though occasionally rendering assistance), nor did it exercise control. The support and control in each village lay in local court and church. In 1652 a trivial (Latin) school (*q.v.*) was opened by the Company in New Amsterdam, but lapsed in a short time. In 1659 another Latin school was opened under the joint support and control of the city and the Company. Private schoolmasters were found in New Amsterdam from an early date. These had to be authorized by the director and council. In the elementary schools the curriculum consisted of reading, writing, less of the arithmetic, the catechism, and certain prayers. Girls attended on equal terms with the boys. Besides the various Dutch settlements certain English-speaking villages were chartered. Possibly many of these had schools, but little is known of them.

Under the English. — After the English occupation the schools of the Dutch communities continued, in most cases, as public parochial schools until about the Revolution. Among the English inhabitants the principle of private enterprise in school affairs on the whole prevailed, as elsewhere in the colonies. Teachers were in theory licensed by the Governor or the Bishop of London. In New York the city authorities and the several churches did a little for the education of the poor by way of charity. In 1702 "An act for encouragement of a grammar free school" was passed, which provided for the appointment, by the Governor, of a schoolmaster to instruct the male children of French, Dutch, and English parents in reading, writing, English, Latin, and Greek. The school was to be supported by taxation, and the schoolmaster to be licensed by the Bishop of London or the Governor of the colony. The law was in force for a period of seven years, and at its expiration the school lapsed. It was not until 1732 that any further legislation took place.

Private instruction and private schools supplied such secondary, as well as elementary, schools as existed during the interim. Trinity School, in New York, dates from 1710. In October of 1732 "An Act to encourage a public school in the city of New York for teaching Latin, Greek, and Mathematics," was passed. The school was to be supported by the income from licenses issued to hawkers and pedlers, and was to be under the visitation of the justices of the supreme court, the rector of Trinity Church, and the aldermen of the city, who could remove the schoolmaster, for cause, and appoint his successor. Twenty free scholarships, distributed among the various counties, were provided. This law was also for a term of seven years, and after eight years this school, too, was discontinued, and the colony once more fell back entirely on private tuition and patronage.

The Society for the Propagation of the Gospel (*q.v.*) early organized elementary schools which in this colony formed no inconsiderable part of the elementary education of the English-speaking villages. Its first school in the colony was organized at Rye, in 1704, and between then and 1775 about sixty teachers were employed, schools being maintained at Albany, and in and about New York.

In 1746 the legislature passed "An Act for raising the sum of £2250 by a public lottery, for this colony, for the advancement of learning and toward the founding a college within the same." This was the first act looking to the foundation of a college for the colony, and the final outcome, after much discussion, was a royal charter from King George II, in 1754, creating King's College, afterwards Columbia University (*q.v.*). Instruction was organized at once, and continued up to the Revolution and the occupation of New York by the British. A grammar school was maintained in connection with the college.

Early State Legislation. — The first state constitution was adopted in 1777, and amended in 1801, but neither the original nor the amendments contained any mention of education. There was little of an educational nature left in the state at the close of the Revolution. A few private and parish schools, a few academies, and a defunct college were about all. Excepting the college, the colony had never considered education as a public function.

In January, 1784, two months after the British left New York, Governor George Clinton, in his message to the legislature, gave the first official expression of the need of educational institutions for the state, and recommended "the revival and encouragement of seminaries of learning." The recommendation received prompt attention, but the final result was a bill to establish a state university. The friends of the defunct King's College now presented a petition for its reorganization, which was substituted for the proposed bill, and the result was the creation, on May 1, 1784, of the Board of Regents of the University of the State of New York, with King's College, now revived and renamed Columbia, as the central feature of the plan. The Regents, of whom there were 31, though the number was further increased to 64 later in the same year, were empowered to found schools (seminaries or academies) and colleges in any part of the state, and to endow them, and every such school or college was to be deemed a part of the University. During the next three years the reëstablishment of King's College (Columbia) occupied the entire attention of the Regents, and practically nothing was done toward establishing academies (or colleges) elsewhere in the state. The dissatisfaction arising from this condition of affairs led to the passage of a new bill, in 1787, under the title of "An Act to institute a university within this State, and for other purposes." All previous acts were repealed; Columbia College was set off, under a separate Board of Trustees, to work out its own development, though regarded as a part of the new and more comprehensive University; and a new Board of Regents of the University of the State of New York of 21 members was created, to whom was given the visitation, inspection, and oversight of "all the colleges, academies, and schools which are or may be established in this State," with power to make by-laws, confer degrees, receive and apply funds, and incorporate colleges and academies. All colleges and academies were to be under their own Boards of Trustees, and all colleges were to have the same corporate rights as Columbia. The University of the State of New York, as thus constituted, has since continued, and has exerted an important influence in the incorporation of academies and colleges within the state. On November 15, 1787, the first two academies (Erasmus Hall and Clinton Academy) were chartered. Since 1787 an annual report of the work of the colleges and academies has been regularly made to the legislature, and since 1835 the condition of the colleges and academies has been published with increasing detail. The University has devoted its energies to examining and supervising, and has not engaged in teaching. In 1863, however, the plan of an annual convocation was instituted, and in 1889 university extension was recognized as one of its proper functions. Professional and technical education, libraries, and museums have also been included.

The bill reconstituting the Regents provided only for secondary and higher education. In 1787 the Regents, in a carefully prepared report, called attention to the deficiencies in their articles of organization, and expressed the feeling "that the erection of public schools for teaching reading, writing, and arithmetic is an object of very great importance which ought not to be left to the discretion of private men, but be promoted by public authority." Again in 1793, 1794, and 1795 the Regents called the attention of the legislature to the desirability of establishing elementary schools. It was not until 1795 that any definite action was taken by the legislature, and the schools created then were organized independently of the authority of the Regents.

Aside from the constitution and reconstruction of the Board of Regents, the first legislative act relating to education was that of May 10, 1784, directing the Commissioners of the Land Office to lay out the unappropriated lands of the state into townships, six miles square, and to reserve in each a lot of 300 acres for the support of a minister of the Gospel, and one of 690 acres for the support of a school or schools. This act must be regarded as merely one of encouragement to religion and learning, and not as a recognition of the principle of public support of schools. In 1790 the legislature made the beginnings of the Literature Fund by authorizing the Regents to take possession of and lease out certain state lands, applying the income to aiding colleges and academies. In 1791 an act was passed which authorized six men, in the town of Clermont, to receive certain excess excise fees and fines collected in the town, and " not wanted for the relief of the poor," and with such funds to build a schoolhouse and maintain an elementary school.

The First School Law. — In 1795, perhaps largely in response to an urgent recommendation of Governor Clinton in his annual message of that year, an " Act for the Encouragement of Schools " was passed. This was the first general school law enacted by the state. It was in the nature of an experiment and was to run for five years only. The sum of £20,000 was apportioned from the state treasury, annually for five years, " for the purpose of encouraging and maintaining schools in the several cities and towns in this state, in which the children shall be instructed in the English language, or be taught English grammar, arithmetic, mathematics, and such other branches of knowledge as are most useful and necessary to complete a good English education." The quotas of the counties were indicated, and within the counties the distribution was made to the towns on the basis of taxable wealth. Each town was to select from three to seven commissioners, who were to supervise the schools and apportion the money among the districts. The inhabitants of the different sections of each town were to associate themselves together for school purposes, and to elect two or more of their number as trustees to employ teachers and to confer with the town commissioners on all school matters. The town school money was to be apportioned to each district on the basis of the number of days taught in each, but no apportionment was to be made unless the town commissioners approved of the teachers selected for the schools. Here may be seen the beginnings of the certification of teachers in the state of New York. By 1798 sixteen of the twenty-three counties organized at that time reported 1352 schools, and 59,660 children in attendance. An effort to extend the law in 1800 failed, and the law expired by limitation. It was not until 1812 that common schools were again organized.

In the meantime certain other important legislation was enacted. In 1799 four successive lotteries to raise $100,000 were authorized; $12,500 was to be paid to the Regents for distribution among the academies, while the remainder was to be placed in the treasury for the use of the common schools, and in such manner as the legislature might later direct. In 1801 another lottery, to raise $100,000, one half of which was to be similarly put into the treasury for the common schools, was authorized. In 1803 the Comptroller was directed to invest the common school money in good real estate. Each year, from 1800 on, the Governor of the state urged the legislature to reëstablish the common school system, and in 1805 Governor Lewis sent a special message in which he recommended the appropriation of all state lands to a school fund, and the creation of a common school system, to be under the supervision of the Regents. Twenty-one academies had been incorporated by this time, but no common schools. The Regents also made similar recommendations to the legislature for three successive years. The result of all these recommendations was the creation of a permanent state school fund by the legislature in 1805. The act as passed provided that the net proceeds of the 500,000 acres of vacant state lands first sold should be applied as the basis for a permanent fund for the support of common schools. The income was to be safely invested, and no distribution was to be made until the annual interest should amount to $50,000 a year. In 1805 the legislature also chartered the " Public School Society of the City of New York," the purpose of which was to establish free schools in the city " for the education of such poor children as do not belong to or are not provided for by any religious society." This Society began to receive aid from the school fund in 1812, was granted a city tax in 1831, and was dissolved in 1853, after having educated over 600,000 children and accumulated property worth $450,000. (See New York City.) It rendered very valuable service to the city and to the state. Further legislation in 1805, 1807, and 1808 added the lottery money and certain bank stock to the permanent school fund. By 1810 the annual income from the fund amounted to about $26,000, and in 1811 the Governor was authorized by law to appoint a commission of five to report a system for the organization and establishment of common schools for the state. This commission made a careful inquiry and reported in 1812. They also submitted the draft of a bill which contained the main features of the law of 1812, and of the common school system up to 1838.

By the law of 1812 the several towns of the state were to be divided into school districts by three town school commissioners, elected as town officers; each district was to elect three district trustees, who were to care for and superintend the school of the district; the interest of the school fund was to be apportioned to the counties and to the towns on the basis of their population by the last U. S. census, and from the towns to the school districts according to the number of children in each, five to fifteen years of age; each town must raise locally as much money as it received from the state; and all state and local taxes were to be used for teachers' salaries. The system of common schools thus established was placed, not under the Regents, but under a new official to be known as a Superintendent of Common Schools, to be appointed by the Council of Appointment. Thus arose the dual system of school administration which characterized New York up to 1904. In 1814 each town was further authorized to elect six additional inhabitants to act with the town commissioners, as school inspectors, and one of their duties was to examine and license teachers. In 1818 the state library was established, and in 1836 the New York State museum. In 1844 the library was placed under the control of the Regents, and in 1889 a library school was established. In the same year the state museum was made an integral part of the university. In 1821, largely in indignation at the removal of the very efficient first Superintendent, Gideon Hawley, the office of Superintendent of Common Schools was abolished, and from then until 1854 the Secretary of State acted *ex officio* as Superintendent. In 1819 the annual state appropriation for schools was raised to $80,000, and in 1819, 1826, and 1827 the school fund was increased by various additions from stocks, land sales, fees, etc. The new constitution of 1822 further devoted the proceeds of all lands belonging to the state to the permanent fund for common schools. By 1831 a fund of $1,696,743.66 had been built up. In 1822 the State School Department was clothed with the important power to hear and decide appeals on questions of school law. In 1826 Governor DeWitt Clinton (*q.v.*) recommended the establishment of a seminary for the training of teachers, and this recommendation was renewed by Governor Flagg, in 1830. By 1828 the income of the Literature Fund had reached $10,000, and this was distributed to the forty-four academies then existing. By 1839 there were 106 academies reporting. In 1830 the first convention of teachers assembled at Utica. In 1835 the school district library system was inaugurated by authorizing a district tax, therefore, of $20 the first year, and $10 yearly thereafter.

New Interest in Education. — In 1837 New York received $4,014,520.71 from the U. S. Treasury as the state's share of the U. S. Deposit Fund (Surplus Revenue of 1836), and this, together with the new movements in Massachusetts and other states, seems to have stimulated a new interest in education in New York. (See articles on separate states.) It was decided at once to devote the income from the Deposit Fund to schools. Of the income, $110,000 was appropriated for common schools. This was to be distributed in the same manner as the income from the state school fund, but, to share in it, districts were now required to extend the school term from three to four months; $55,000 was also to be distributed in the same manner, to be used for school libraries only until 1842, and thereafter for libraries or teachers' salaries; $28,000 a year was to be used by the Regents to aid academies; and the balance of the income was to be added to the principal of the permanent school fund. Following this a number of important laws were enacted, looking toward free schools and supervision, which finally culminated in the rate bill compromise of 1850 and the reëstablishment of the office of State Superintendent of Schools in 1854.

In 1839 the appointment of unsalaried county boards of visitors marked the beginning of county supervision. They were to make suggestions for improvement, and as a result of their supervision, the law of 1841 provided for a Deputy Secretary of State for Schools, and for a deputy superintendent of common schools for each county. These latter were to be appointed by the supervisors of the county, were to examine and certificate teachers for the county, and were to have general supervision of all the schools of the county, subject to the rules and regulations of the state office. The town inspectors were reduced to two, and the certificates issued by the town authorities were limited to the town. In 1843 both the town commissioners and inspectors were abolished, a town superintendent of schools succeeded to their duties and functions, and the name of deputy superintendent was changed to that of county superintendent of schools. The Secretary of State was made *ex officio* a Regent in 1842, and in 1843 was also granted power, on proper recommendation or evidence, to grant state teachers' certificates. In 1847 the office of county superintendent was abolished; in 1854 a separate state department of public instruction was created and a State Superintendent of Public Instruction appointed; and in 1856 the office of town superintendent of schools was in turn abolished and the office of school commissioner (one for each legislative assembly district, to be elected by the people for three-year terms) was in turn created. At this point the system of supervision created remained fixed until very recently.

The period up to 1854 was also characterized by new undertakings with reference to teachers and their training, and the impulse given then has continued down to the present. In 1834 the first teachers' training classes had been established, one in each of the eight judicial districts of the state. The academies were appointed to give the instruction, and the first classes were opened in 1835. This was probably the first public provision for the professional training of teachers in the United States. An appropriation of $500 for books and apparatus, and $400 annually for an instructor, was made by the state for each Senatorial district. After ten years, all state aid to the academies for training classes was withdrawn, and the state established its first normal school at Albany (1844), but after another five years, the demand for local training classes became so strong that they were reëstablished, and the aid reëxtended in 1849 has never since been withdrawn. In 1877 high schools and academic departments were also admitted to the privilege of maintaining training classes. A second state normal school was established at Oswego in 1863; three additional schools at Cortland, Fredonia, and Potsdam in 1866; three more at Geneseo, Brockport, and Buffalo in 1867; three more at New Paltz, Oneonta, and Plattsburg between 1886 and 1892; and a twelfth state school at Jamaica in 1893. In 1881 some standards for the admission of pupils to the normal schools were imposed, and these have since been very materially added to. In 1843 the first teachers' institute was held at Ithaca, and in 1847 teachers' institutes were placed under state control and the first state aid to them ($60 to each county organizing) was granted. In 1859 this was doubled, and in 1860 the appropriation for the state was fixed at $8000. In 1862 local authorities were permitted to pay teachers their salaries while attending; in 1881 a state corps of institute conductors was organized; in 1885 attendance was made compulsory; and in 1892 a state bureau of institutes and training classes was organized under the State Superintendent. The state appropriation for institutes steadily increased up to 1910, when they were abandoned.

Battle for Free Schools. — The application of the U. S. Deposit Fund to education, and the various state and contemporary movements for educational improvement, seem to have stimulated an interest in providing free common schools for all, and the next decade witnessed a great struggle for free schools. In the convention which formed the new state constitution of 1846, a clause providing for free schools, to be supported by general state taxation, failed by a narrow margin. In 1849 the Secretary of State made a strong plea for the abolition of the rate bill (*q.v.*) and for free schools for all, and that year "an Act establishing free schools throughout the state" was passed. The act, however, was not to be effective unless approved by a referendum vote of the people at the November elections. The result was a vigorous campaign for free schools, and the election was carried by a vote of 249,872 for and 91,951 against. Schools were to be made free to all children, five to twenty-one years of age; county supervisors were to levy a county tax twice that received from the state; and any needed balance was to be raised by district taxation. So vigorous were the opponents of free schools, however, that the legislature of 1850 called a second referendum on the repeal of the free school law. This the people failed to favor by a vote of 184,308 for repeal and 209,316 against. Strong objections still existed, and the legislature was flooded with petitions for the amendment or the repeal of the free school law. Finally, in 1851, a compromise bill was enacted, entitled "an Act to provide free schools throughout the state." Schools were declared free to all children, five to twenty-one years old, and an annual state tax of $800,000 was to be levied on all property for their support. The proceeds of this tax, together with the income from the state school funds (then $300,000 a year), was to be distributed to the different school districts of the state maintaining a six months' term, one third to all equally, and two thirds on their school census. Any additional money needed was to be obtained by the rate bill, though all indigents were to be exempt. In 1853 the free school law of 1849 was declared unconstitutional, though this decision, owing to the compromise of 1851, had little effect. The cities generally refused to employ the rate bill, and early made their schools free. In 1857 the state tax was changed to a three fourths of a mill tax, which increased the state aid one third. Still, in that year, $427,956 was collected from rate bills. Finally, in 1867, the state tax was increased to 1¼ mills, and the rate bill was abolished in the state.

Other Legislation. — Some other significant school legislation was also enacted during the period of struggle to establish school supervision, the training of teachers, and free schools. In 1846 the first provision by the state for the education of Indian children was made, and in 1856 the Indian schools were placed under the charge of the State Superintendent of Public Instruction. In 1853 the first compulsory school law was passed. The law provided that vagrant children, five to fourteen years of age, could be taken before a magistrate and their parents compelled to agree, in writing, to send them to school four months each year until they were fourteen years old. Massachusetts alone was earlier in the enactment of such a law. Public sentiment was against it, however, and the law but little enforced. In 1853 the union free school law was passed. Under this, any district, or union of districts, could provide a free school, levy taxes for the same, and establish academic (secondary) departments when deemed necessary or desirable. The elementary schools were under the supervision of the state, county, and local school authorities, but any academic departments established were subject to the inspections and regulations of the Regents. These schools materially helped the movement for free schools, though their dual form of supervision later led to conflicts between the two state systems and emphasized the need for a unification. An attempt at this unification was made in 1836 and 1837, but the movement failed. In 1870 a bill providing for uniformity was passed, but was vetoed by the Governor. Here the matter rested until 1898. In 1865 the Regents' preliminary examinations were held for the first time, and in 1878 the first advanced examinations. In 1866 the power to condemn land for school purposes was given to the local school authorities, and in 1868 a state institution for the blind was established at Batavia.

The period from 1868 to 1886 has been termed the period of quiescence in the history of the New York school system. There was but little legislation, and none of any fundamental importance. No extension of the powers of the State Superintendent took place, during this period, and the increase in both state and local taxation barely kept pace with the increase in population. In 1874 a second compulsory education law was passed, this time requiring attendance of all children, eight to fourteen years of age, for fourteen weeks each year, eight of which must be consecutive. The local authorities were empowered to enforce the law, but little was accomplished under it. In 1875 it was provided that the State Superintendent should issue life diplomas only on examination, instead of upon recommendation. In 1876 the counting of private or parochial school pupils for public school purposes was prohibited. In 1883 the rule of the Court of Appeals, requiring intending law students to pass an examination, was enforced by the Regents, and in 1889 intending medical students were also required to pass the Regents' examination.

From 1886 to 1904. — Beginning about 1886, and continuing down to the present, the renewal of interest in educational legislation and the extension of the central control have been marked. In 1885 religious instruction and exercises had been prohibited in the schools, and in 1887 the wearing of any distinctive garb was also prohibited. In 1887 a uniform system for the examination of teachers was adopted by the State Superintendent. This was at first acquiesced in by the school commissioners of the state, but was made mandatory by law in 1894. The same year institutes were changed from county institutes to school-commissioner-district institutes. In 1889 the supervision of all teachers' training classes in the high schools and academies of the state was transferred from the Regents to the Superintendent of Public Instruction. In 1889 the laws relating to the powers and duties of the Regents enacted during the previous century were revised and consolidated. In 1890 better regulations for the government of the normal schools were provided. In 1891 the university extension department was established by the Regents. In 1892 the old district library law was revised, and districts were required to duplicate the state grants. Specifications and plans for schoolhouses, varying in cost from $600 to $10,000 were also secured and furnished by the state office from this year on.

In 1894 a new state constitution was adopted. This made the first definite constitutional provision for a state school system; made the Regents a constitutional body; safeguarded the different funds; and prohibited aid to denominational schools. In the same year the " Consolidated School Act," the first consolidation and revision of the school laws since 1864, became a law. A new revision of the compulsory education act, which changed this into an effective law, and the creation of a Board of Examiners and the placing of full control of all teachers' examinations in the hands of the State Superintendent, were also enacted in 1894. In 1895 a law was passed requiring that all teachers employed in elementary schools, after 1897, must have taught three years, or be graduates of a three years' course in a high school or academy and have had a course of thirty-eight weeks in a teachers' training class. Teachers in city schools must have had a two years' training course. The Biennial School Census Act and the Horton Act were also passed in 1895. Under the Horton Act, the Regents were given an automatically increasing appropriation to enable them to aid properly the academies and high schools of the state. The result of this law was a marked increase in both the number of such schools and the annual appropriations for them. In 1896 school districts were permitted to contract with other districts for the education of their children; city institutes and state summer institutes were established; and all teachers' certificates were to be made to expire at the end of the official school year. In 1900 new uniform regulations for the granting of teachers' certificates went into effect, and all certificates granted in the future were to be based on the use of the same questions as for a first-grade certificate. In 1903 the compulsory attendance law was again revised, and made more effective. In 1904 a Teachers' Information Bureau was established in the department.

Unification; Recent Advances. — The year 1904 saw the final unification of the two educational departments of the state school system, and the ending of more than a quarter century of friction. After 1870 no attempt at unification seems to have made any headway until about 1898. In this year a large number of bills for the unification of the two departments, or for a clearer demarcation between them, were introduced in the legislature, but no action was taken. In 1899 the Roosevelt Commission was appointed to study the situation. It reported a bill for the unification of the two departments in 1900, but the bill failed of passage. By 1903 the feeling had become so bitter that there was a deluge of bills on the subject, none of which passed. Instead, the legislature appointed a joint committeee to study the question and to report to the legislature the next year. The result was the Unification Act of 1904, providing for a reduced Board of Regents, for membership for limited terms instead of for life, and for essentially the present form of state educational organization. The first Commissioner, however, was to be elected by the legislature instead of by the Regents. This law took effect April 1, 1904, and since then the Regents and Commissioner have construed the law liberally, and in the interests of the schools of the state. A state educational building, to house the departments, the state library, and the state museum, was provided for in 1906; trade schools were authorized, and the new school census law was passed in 1908; and the compulsory education law, as it related to cities and school systems having a superintendent, was further revised and strengthened in 1909. In 1909 the consolidated school law, as codified and consolidated by the State Board of Statutory Consolidation, was passed, and the further revision, recodification, and elimination of this, as made by the Education Department, was accepted by the legislature in 1910. In this the working arrangements of the Regents and Commissioner, as practiced since 1904, were incorporated into law. The most important legislation in 1910 was the substitution of district superintendents of schools (beginning January 1, 1912) for the old popularly elected school commissioners, in existence since 1856. About twice as many district superintendents as school commissioners were provided for, so as to reduce the size of the supervisory unit one half. The legislature of 1910 also amended the industrial education law, by including agricultural instruction; passed a retirement law for teachers in certain state institutions; and abolished the teachers' institutes, formerly conducted by the state. The most important legislation of 1911 was the teachers' retirement fund law. Two other important laws permit courts to legalize proceedings for school bond issues, and create a state advisory board in relation to agricultural education and country life advancement.

Present School System. — The Board of Regents for the University of the State of New York, and their executive officer, the Commissioner of Education, have a centralized control over the educational system of the state to a degree found in scarcely any other state. Educational functions, which in other states are intrusted to county superintendents and county boards of education, are here given to the Commissioner of Education. The only local unit possessing much power is the school district, which in New York still exercises rather large powers.

The Board of Regents, as reorganized in 1904, now consists of twelve members, elected by joint ballot of the legislature and in the same manner as Senators are elected. Their term of office is twelve years, one member going out of office each year. The officers of the Board are a Chancellor and a Vice-Chancellor, elected from their own number and serving without salary, and a Commissioner of Education, who is to be " the chief executive officer of the state system of education and of the Board of Regents."

The Board of Regents form a supervisory and examining body for the entire secondary, higher, and professional school system of the state, and possess rather unusual powers. The University of the State of New York is a comprehensive term, the University including all schools under the supervision or control of the Board of Regents. The University, as such, employs no professors, however, and does no teaching. The annual convocation is a meeting held for the consideration of educational problems, and at this meeting the Regents may confer honorary degrees. The Regents possess legislative power, subject to the constitution and laws of the state, over the educational system of the state. They may incorporate and charter, according to law, any institution or association for the promotion of literature, art, science, history, or similar purpose, and no such institution can be incorporated by a general law without the consent of the Regents. The state library and the state museum, including the office and staffs of the State Geologist, State Paleontologist, State Botanist, and State Entomologist, are departments within the university, and the Regents may establish other departments or divisions as they deem useful or expedient. It is unlawful to use the name college or university within the state, except as authorized by the Regents; no institution in the state may confer degrees unless it has $500,000 in resources; and the selling or granting of degrees by unauthorized institutions is prohibited. All entrance to the professions of medicine, pharmacy, and optometry must be by Regents' examinations, law alone not being under their control. The Regents also examine and approve for practice all nurses and public accountants. They establish standards and examinations for graduation from the secondary schools of the state, issuing Regents' certificates showing the subjects passed and the " counts " or units made. They may register foreign and domestic institutions of learning of all kinds, and may evaluate their diplomas in New York terms. They are authorized to extend increased educational facilities to the people in such forms as they deem wise, and to this end are authorized to buy and loan books, maps, lantern slides, pictures, etc. All academies, academic (secondary) departments of public schools or other institutions, and all libraries and museums must report to the Regents annually, and the Regents' rules and regulations must be complied with if such institutions are to share in the financial grants. Money grants made to libraries can be spent only for books approved for purchase by the Regents. All institutions under the supervision of the Regents must be open at all times to inspection of the Regents or their representatives.

The Commissioner of Education holds office at the pleasure of the Regents, and is paid $7500 salary, and $1500 additional in lieu of all traveling expenses. In his selection, residence within the state is not essential. As the chief administrator and executive officer for both the common schools and the secondary and higher schools of the state, he possesses large powers. The Regents may decide policies, but the Commissioner executes all policies once decided upon, and enforces all the educational laws of the state and the rules and regulations of the Regents. He has general supervision over all schools and institutions of an educational nature; may visit and inspect them as he deems best; and may advise the officers of any schools. He is also given supervision of the different normal schools and the normal college of the state; determines the number of teachers for each, and their salaries; approves all appointments to the different faculties; countersigns all diplomas; and appoints the local boards which have immediate control of the different schools. *Ex officio*, he is a trustee of Cornell University, and he directs the annual examinations for state scholarships in the university. He may remove from office any school officer in the state for neglect or willful violation, and may also withhold state school money from any school districts for the same cause. He has power to require information and evidence, administer oaths, and to bring proceedings to enforce the educational laws or the orders of the Regents. He is given and may execute such further powers and duties as the Regents may charge him with. He prepares all registers and blank forms for teachers and school officers; all school officers must report to him annually, and as requested; he approves all plans for new school buildings or additions to buildings, except in cities of the first and second classes. He makes rules and regulations for the examination of teachers, with the approval of the Regents; keeps in his office a record of all diplomas and certificates in force; and may annul, for cause, any teacher's certificate or diploma. He maintains a legal division for the decision of all appeals on school questions, and his decisions have the force of law. He designates all academies, union free schools, and high schools in which teachers' training classes may be organized; prescribes the conditions of admission and the course of instruction; makes rules and regulations for their government; and approves the money grants to such schools. He apportions, according to law, the state aid to common schools, academies, high schools, libraries, and industrial schools, and in making appointments is allowed certain discretion. He may withhold one half of the state money from the district which fails to enforce the compulsory education law. The Indian schools of the state are under his sole jurisdiction. He is responsible for all books and records in his department, and also for the proper administration of the offices. He is assisted in his work by three assistant commissioners, the directors of the state library and the state museum, and nine chiefs of divisions, as follows: administration, attendance, educational extensions, examinations, inspections, law, school libraries, statistics, trade schools, and visual instruction.

There are no county superintendents in New York. In their place we find (beginning Jan. 1, 1912) district superintendents, elected by a small body of town school directors for five-year terms. Each town in each supervisory district of a county was to elect two persons, in 1910, to be known as school directors, one for three years and the other for a five-year term, and thereafter, as their terms expire, their successors are to be elected for five-year terms. These school directors, in 1911 and every fifth year thereafter, are to meet and elect the division superintendent, this being their sole duty. Women are eligible for the office, and the superintendent elected need not be a resident of the district or county.

The fifty-seven non-city counties of the state are divided, according to size, into 207 superintendency districts, as follows: —

1 district to the county, 4 counties.
2 districts to the county, 8 counties.
3 districts to the county, 18 counties.
4 districts to the county, 13 counties.
5 districts to the county, 7 counties.
6 districts to the county, 4 counties.
7 districts to the county, 2 counties.
8 districts to the county, 1 county.

No city or district employing a superintendent of schools is to be included in a superintendency district. These districts are to be contiguous and compact, and no town is to be divided in their formation. The salary of each district superintendent is $1200, paid by the state, with $300 for traveling expenses, and as much more as the supervisors of the towns in the districts see fit to add. Each superintendent must hold a state teacher's certificate, and a special certificate in the supervision of agriculture, and he must devote his entire time to the work of supervision. He succeeds to the powers and duties of the school commissioners. These powers and duties are to keep a record of the boundaries of the school districts; to conduct local institutes; to appoint district trustees, in case of a vacancy, if the district fails to elect; to inspect any teachers' training classes in his district, and report on the same to the Commissioner of Education; to meet with the school trustees of the district, and to advise with them as to details of school management; to administer oaths, and to transmit testimony in appeal cases to the Commissioner of Education; to act for another district superintendent on request, or when directed to do so by the Commissioner; to examine and license teachers, to conduct examinations for the State Department, and to revoke the certificates of teachers in his district, for cause; to make investigations and report to the Commissioner of Education, as requested; and to act subject to the rules and regulations of the Commissioner. He may order repairs to any schoolhouse up to a cost of $200 or to furniture up to $100; may order nuisances abated; and may condemn schoolhouses. If a school is condemned, a district meeting is called, at which the district superintendent presents an estimate of needs. This estimate cannot be scaled down by the meeting to exceed 25 per cent, and, if no district action is taken within thirty days, the trustees must proceed to build a building, which must cost not less than 75 per cent of the estimate presented by the district superintendent. He may organize new school districts, and may dissolve or consolidate districts, as educational interests seem to require, though an appeal from his decision may be taken to the Commissioner of Education.

Each county is also divided into a number of towns, and these in turn into school districts. For each town there is a representative supervisor and a town clerk, both of whom possess some educational functions. The supervisor has control of any gospel or school lands or funds possessed by the town; receives all school moneys due to his town from the county treasurer, and pays out the same on orders from the districts; if the districts elect a treasurer, he then turns the money over to him; and he acts as a general supervisor of the different school districts in all money matters, making an annual report on finances to the county treasurer. The town clerk acts for the town in all school matters as an intermediary between the district superintendent and the school trustees of the districts, seeing that notices are given; reports made, records preserved, etc.

A town unit of school administration has not yet been evolved, and town consolidation of schools has not as yet been begun, except in so far as districts are allowed to contract for the education of their children instead of maintaining a school themselves, and except as a town may be a city or a union free school district. Otherwise, the towns are divided into a number of school districts, each with its own officers. A district may have one trustee, elected annually, or three trustees, elected for three-year terms, one going out of office each year. A district also has a district clerk and a district collector, and it may, in addition, elect a district treasurer to take charge of its funds and pay all bills. These officers are elected in annual meeting for one-year terms. The trustees are to insure and care for the property; make up the tax lists for collection; purchase or lease sites, and erect buildings, as directed; make repairs and abate nuisances; employ teachers; prescribe the studies to be taught; make rules and regulations; issue orders on the funds for salaries and other bills; establish branch schools, when needed; and make annual and other reports to the division superintendent and to the annual district meeting. An annual meeting is held in May in each district, and special meetings may be called. The meeting hears the reports of the district trustees; elects a new trustee and the other school district officers; designates and changes all textbooks; can select a schoolhouse site; and must vote, by ballot or by aye and nay, all taxes for maintenance, library, schooling elsewhere, high school tuition, repairs, or new buildings. Women may vote on the same terms as men at such meetings.

In any district, on petition of fifteen inhabitants, or on petition of fifteen inhabitants in each of two or more contiguous districts, a school meeting may be called to vote on the question of forming a union free school district and electing a board of education. This is an old institution in the state of New York, and has rendered valuable service in providing free schools and secondary education. Similarly, a union free school district may call a meeting to dissolve into its original districts, though in this case, the district superintendent may veto the proposal. Each free school district has a board of education of from three to nine, one third going out of office each year. If there are 300 children in the district, an election by ballot takes the place of a school district meeting election. If the union free school district is coterminus with a city, the city treasurer acts as treasurer of the district, but if the bounds do not coincide, the school district elects its own treasurer.

Boards of education in all free school districts have, in addition to the powers of district trustees, the power to adopt textbooks; to establish an academic department (high school), kindergartens, or a night school; to provide medical inspection; appoint a truant officer; and, if the district has 5000 population, they may appoint a superintendent of schools. Instead of establishing a high school, the district may vote to adopt an existing academy as its academic department. The board must present to the annual district meeting, or to the proper city authorities, if a city, an annual estimate of the money needed for teachers' salaries, contingent expenses, and other items. The voters, or city authorities, cannot decrease the amounts for teachers and contingent expenses, but may decrease or increase all other items.

An important part of the school system of the state of New York is the large cities, most of which operate under special charters, and maintain extensive and important school systems. Three of these, Albany, Buffalo, and New York City, are described in special articles (*q.v.*). About 60 per cent of the people of the state reside in cities of over 100,000 inhabitants, and 52 per cent are in the city of New York.

School Support. — The permanent common school fund and the literature fund for aiding academies each produces but relatively small amounts, and the total value of all permanent school funds in the state is only a little over nine millions of dollars. The income derived from these forms but a small part of the annual state appropriations, and bears no relation to the rapid increase in the cost of education. During the past twenty years the cost of maintaining schools in the cities has quadrupled, and doubled in the towns. In lieu of state taxation, annual appropriations for education are made by the legislature. These are constantly increasing and are calculated in advance so as to meet legal needs. The state appropriation for the maintenance of common schools is now about five millions annually, and this is apportioned in such a manner as to divide it about equally between the cities and the towns. As the cities spend about three times the total amount spent by the towns, the state grants pay about one twelfth of the cost of education in the cities and about one fourth of the cost of the towns. The balance is paid by local taxation in the school districts, there being no county school taxation in New York. This system of distribution is the result of a wise but somewhat complex plan for the apportionment of school money, in which the teacher is made the unit and in which poor and small districts are given an initial advantage over large and wealthier ones. Orphan asylums may share, under certain conditions. Every city or district having over 5000 inhabitants and employing a superintendent of schools, also receives a superintendent's quota of $800. The state appropriation for academies, high schools, and libraries is now about three quarters of a million dollars annually, and this is apportioned in a still more complex manner. In 1910, 10 per cent of this appropriation was given as a school quota, 25 per cent was for books and apparatus, 35 per cent was for the instruction of non-residents, and 30 per cent was given on the basis of average daily attendance. Academies and high schools maintaining an approved course for the training of teachers receive $700 additional, and the city training schools are paid on the basis of average daily attendance. The salaries of district superintendents and the expenses of Indian schools are paid by the state. In addition, the annual appropriation for salaries, traveling and miscellaneous expenses, examinations, and books for the state educational department now exceeds $600,000.

Educational Conditions. — The state has many cities and a very cosmopolitan population. Two thirds of the total population live in cities of over 8000 inhabitants, while only one fifth live in country districts. A little over one fourth, 29.9 per cent, of the total population is foreign born, and in the cities the percentage is much higher. The city school systems are well developed and offer good instruction. The compulsory education and child labor laws are good, and the school census law for metropolitan cities, which may be adopted by any other city, is one of the best in the United States. But 1.5 per cent of the total population is of the negro race, though in the large cities this percentage runs much higher. No exclusion from any school is permitted on the basis of race or color, though the inhabitants of any district may provide separate schools for those of the colored race. Since 1895 the money spent for public schools has increased rapidly, being two and a half times as much in 1910 as in 1895. The total value of the public school buildings has trebled in the same time, while the average value has a little more than doubled ($2618 in 1910). During the same period the total school enrollment has increased 22 per cent and the number of teachers employed, 57 per cent. The rural schools have made much less progress than the city schools during the past two decades, perhaps in part due to the strength and conservatism of the district form of control. The consolidation of schools and the transportation of pupils has as yet made no marked headway in the state, though some 800 districts now employ the contract system, in whole or in part. There are still 10,565 school districts (1910) in the state, as opposed to 11,089 fifteen years ago, and 11,262 twenty-five years ago. The school term has remained nearly stationary at an average of about thirty-five weeks per year for the past twenty years. Recently it has advanced to thirty-seven weeks. A state syllabus (course of study) covering the eight years of the elementary course was issued in 1904, and a revision, covering only the first six years, was issued in 1910. School libraries, traveling libraries, the division of visual instruction (for the loan of pictures, charts, lantern slides, and specimens to the schools), and the extension division are marked features of the New York school system and do much to increase its efficiency. (See MUSEUMS.)

Teachers and Training. — Of the 45,076 teachers employed in 1910, 60 per cent were employed in the cities. Of the total teaching body in 1910, 7 per cent were college and professional school graduates, 20 per cent graduates of normal schools, 28 per cent graduates of teachers' training classes, 6 per cent held state teachers' certificates, and 37 per cent had been certificated by the local authorities. All new teachers for elementary schools must be experienced or have had professional training, and the equivalent of a high school education. All examinations for teachers' certificates are now conducted by the division of examinations of the State Education Department, under rules and regulations prescribed by the Commissioner of Education, and with the approval of the Regents. State normal school diplomas and state certificates from other states may be accorded equal privileges in New York. For the training of future teachers, the state maintains ten state normal schools, the Albany normal college, and, in addition, extends aid to ninety-five high schools and academies and to fifteen cities for offering teachers' training courses. Teachers' institutes, which have previously been under the state department and in charge of institute conductors, are to be discontinued after 1911, the new district superintendents being expected to conduct local teachers' meetings on Saturdays, or at other times when the schools are not in session.

Secondary Education. — The development of secondary schools has been especially marked since the passage of the Horton aid law in 1895, the number of academies having increased from 131 to 167, and the number of high schools from 373 to 702 since then. The number of students and teachers has also undergone a rapid increase. In addition, 199 private high schools made reports in 1910. Since 1895 the Regents' academic examinations have been based on the completion of a four-year high school course. Syllabi (courses of instruction) are issued by the state department and inspections of work are made, though there has been a tendency to decrease the rigidity of the state requirements since the unification.

Higher Education. — The state maintains no state university, in the sense that the western states do. It has been proposed to evolve the University of the State of New York into a graduate institution for the study of history, politics, economics, education, and science (Sherwood); to evolve Cornell University from the position of a semi-state university to that of a real state university; and to evolve, instead, a series of municipal universities, extending across the state (Draper). The land grant for a college of agriculture and mechanical arts (law of 1862, 990,000 acres) was given to Cornell University, at Ithaca. In return for this, the university receives free of tuition one student each year from each legislative assembly district in the state,

NAME	LOCATION	OPENED	CONTROL	FOR
Columbia University	New York City	1754	Nonsect.	Men
Union University	Schenectady	1795	Nonsect.	Men
Hamilton College	Clinton	1812	Nonsect.	Men
Colgate University	Hamilton	1819	Nonsect.	Men
Hobart College	Geneva	1822	Nonsect.	Men
Rensselaer Polytechnic Institute	Troy	1824	Nonsect.	Men
New York University	New York City	1832	Nonsect.	Both sexes
Alfred University	Alfred	1836	Nonsect.	Both sexes
Fordham University	New York City	1841	R. C.	Men
St. Francis Xavier College	New York City	1847	R. C.	Men
College of the City of New York	New York City	1849	City	Men
University of Rochester	Rochester	1850	Bapt.	Both sexes
Polytechnic Institute	Brooklyn	1854	Nonsect.	Men
Elmira College	Elmira	1855	Presby.	Women
Niagara University	Niagara	1856	R. C.	Women
St. Lawrence University	Canton	1858	Univ.	Both sexes
St. Francis College	Brooklyn	1859	R. C.	Men
St. Bonaventure's College	St. Bonaventure	1859	R. C.	Men
St. Stephen's College	Annandale	1860	P. E.	Men
Manhattan College	New York City	1863	R. C.	Men
Vassar College	Poughkeepsie	1865	Nonsect.	Women
Wells College	Aurora	1868	Nonsect.	Women
Cornell University	Ithaca	1868	Nonsect.	Both sexes
Canisius College	Buffalo	1870	R. C.	Men
Syracuse University	Syracuse	1871	Meth.	Both sexes
Barnard College	New York City	1889	Nonsect.	Women
Keuka College	Keuka Park	1890	Free Bapt.	Both sexes
Adelphi College	Brooklyn	1896	Nonsect.	Both sexes
Clarkson School of Technology	Potsdam	1896	Nonsect.	Men
College of St. Angela	New Rochelle	1904	R. C.	Women

the appointments being awarded on the basis of competitive examinations. The state has also recently established three additional schools of agriculture, for elementary and practical investigation and instruction, the work to be coördinated with that of Cornell University. These are at St. Lawrence University, in northeastern New York (1906); at Alfred University, in western New York (1908); and at Morrisville, in central New York (1908).

The work of providing higher education for the state of New York is carried on by a number of institutions, on which separate articles will be found, as shown on the previous page.

Special Education. — The state maintains sixteen special institutions for the care and education of the deaf, dumb, blind, feeble-minded, and for truant and incorrigible children, and makes arrangements with a number of other institutions of a semi-private nature, but open to state visitation and inspection, for the care of some of its deaf, dumb, and blind. Orphan asylums are also granted, on inspection and approval, teachers' quotas in the annual state apportionment of school money. A few of the cities also maintain truant and reformatory schools, though the city truant or parental school has not as yet been much developed by the cities of the state.

E. P. C.

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NEW YORK TEACHER. — See Journalism, Educational.

NEW YORK UNIVERSITY. — New York University was founded in 1831 through the influence of a group of men in New York City who conceived the idea of a university that should serve all classes of people and all professions. The plan of the founders contemplated a college, engineering school, school of law, school of medicine, school of education, school of agriculture, and graduate school. The first Chancellor was the Rev. James M. Matthews, D.D. The site at Washington Square was acquired in 1833 and the cornerstone of the first university building was laid in the summer of that year. The institution opened with the regular college courses and with special courses in mathematics and science for engineers. The law school was established in 1835 and the medical college in 1839. Through lack of funds the institution did not progress beyond these beginnings for the first half century of its history. This early period was rendered distinctive however by the ability and achievement of members of the University's faculty. Professor Samuel F. B. Morse invented the recording telegraph and Dr. John W. Draper perfected Daguerre's system of photography and took the first picture of the human countenance within the University walls during this period; while Dr. Valentine Mott as dean of the medical college and Benjamin Butler as principal of the law faculty lent luster to the professional schools.

The expansion of the institution into its present organization of 10 faculties, 370 instructors, and 4400 students, has taken place within the past twenty-five years under the sixth Chancellor, Dr. Henry Mitchell MacCracken. Under his efficient administration the magnificent site at University Heights was acquired in 1891 and was gradually increased until it reached its present extent of forty acres. The three original schools have been reorganized and new schools founded until now the instruction is carried on at four different centers as follows: —

At University Heights — The College of Arts and Pure Science (1831), the School of Applied Science (1862) and the Summer School (1895). At Washington Square — The Graduate School (1886), the School of Pedagogy (1890), the School of Commerce, Accounts, and Finance (1900), the Washington Square Collegiate Division (1903) and the Woman's Law Class (1890). At First Avenue and Twenty-sixth Street — the University and Bellevue Hospital Medical College (1841). At 141 West 54th Street, the New York American Veterinary College (1899).

This lack of concentration of all the schools at one common center is not the result of chance but is due to the policy of the University to carry its educational facilities to the people and to offer it at centers that are most advantageous and most accessible. As a logical outcome of this policy the University established the extra-mural division in 1909, the first department of its kind in America, and this division now gives University instruction at various centers outside the University walls.

The corporation of the University is the Council, a self-perpetuating body of thirty-two members, one fourth of whom go out of office annually. The Women's Advisory Committee, consisting of women appointed by the Council, was organized in connection with the founding of the School of Pedagogy in 1890 and has done effective service in the University's work for women, aiding in the raising of endowment, furnishing of equipment, and the establishing of new courses. The University Senate, consisting of the chancellor, the deans of the schools, and one professor from each faculty, takes action regarding matters common to all the Schools and makes recommendations thereon to the University Council. The administrative officers are five in number, viz.: The chancellor, the syndic, the bursar, the registrar, and the secretary to the chancellor. Each faculty has its dean and secretary. The dean is the medium of communication between the faculty of his school and the chancellor; the chancellor is the medium of communication between the several faculties and the Council. Dr. Elmer Ellsworth Brown, formerly United States Commissioner of Education, is Chancellor. G. C. S.

NEW ZEALAND, EDUCATION IN. — This system can best be understood when it is recollected that the country, now a federated dominion, was formerly divided into provinces under separate governments. This was the case from 1853 to 1876. In each of the principal provinces, between the years 1855 and 1857 a system of public elementary education was established. The schools were conducted by local committees and a central board at each provincial capital, and were variously supported by treasury grants, fees, charges on householders, donations and rates on property. The provincial system of public education survived the provinces themselves, which were abolished in 1876; but in 1878 a system, free, compulsory, and secular, was established, although provincial boards and inspectors were and are still retained.

The present system of administration of public instruction in New Zealand is described in an official account. "The Dominion is divided, for purposes of primary education, into thirteen education districts, generally coextensive with the old provinces or with subdivisions of them. The education districts are subdivided into a large and increasing number of school districts, in each of which there is a School Committee of five to nine members elected annually by the householders. In each education district there is an Education Board of nine members, elected three every year for terms of three years by the members of the School Committees. Under an Act of 1905 every education district is divided into three wards, each of which returns three of the nine members of the Board. Subject to general supervision and control by the Board, and to inspection by the Board's Inspectors, the Committee has the management of school business within the school district. The Board appoints and removes teachers, but only after consulting the Committee.

The Education Department, which is presided over by the Minister of Education, is charged, in the first place, with the general supervision and control of the system of primary instruction, and, further, with the development and extension of a general system of secondary and technical instruction. Also with the direct control of the system of public school cadets, of the schools for children of the Maori race, the special schools for deaf and for mentally defective children, and the schools for destitute, neglected, and criminal children. Incidentally it has the administration of the Act for the protection of infant life. It takes an active interest in the education of the blind. It distributes the grants made by Parliament to public libraries. In order to provide suitable reading matter for the children in the public schools the Department prepares and issues a free School Journal. The Minister is required by statute to report to the Governor every year on the progress and condition of public education in the Dominion.

The precise manner in which the provisions of the various statutes that relate to the public primary schools shall be carried out is fixed from time to time by regulations made by the Governor in Council. Among the matters so controlled by regulation are the following: Attendance registers and returns, the authorization of class books, the inspection and examination of schools, teachers' certificates, training colleges for teachers, pupil-teachers, examinations for scholarships tenable at secondary and technical schools, for entrance into the public service and for promotion in it, manual and technical instruction, scholarship, public-school cadet corps, staffs of schools, and salaries of teachers, the payment of grants to Education Boards and the auditing of Boards' accounts.

One of the principal functions of the Department is to distribute to the Education Boards and other educational authorities, in the manner prescribed by law, the grants voted by Parliament for the salaries of teachers and for the maintenance of primary schools and training colleges, and secondary and technical classes, and for the erection and repair of school buildings and for higher education.

The status and progress of public elementary education in New Zealand may be best illustrated by the following table compiled by the Education Department at Wellington, New Zealand.

	1870	1906
Population, exclusive of Maoris	417,622	908,718
Public primary schools . . .	730	1,847
Children on the school rolls . .	55,688	139,302
Teachers, male	648	1,314
Teachers, female	449	1,887
Pupil-teachers, male	82	153
Pupil-teachers, female	221	518
Total teaching staff	1,400	3,872
Inspectors.	10	32

Of these 139,302 children on the rolls, 72,917 were boys and 66,385 were girls. The total expenditure of the education department on all accounts for the year ending the 31st March, 1907, amounted to £923,574.

The official account of primary education in New Zealand will show how the situation differs from that in the Australian states, where public education is supported and controlled by the state from the consolidated revenue, without any form of local control or support.

" From 1878 to 1901 the public schools were maintained mainly by a statutory grant out of the consolidated revenue of the colony at the rate of £3 15*s*. a year for every unit of the average daily attendance, supplemented by additional capitation allowances varying from 4*s*. to 10*s*., and by grants averaging about £45,000 a year for the erection and maintenance of school buildings. During that time every Board had its own scale of staffs and salaries, and there was considerable inequality in the remuneration of teachers under different Boards. But ' The Public-School Teachers' Salaries Act, 1901,' fixed the relation of the number and the pay of the teachers in a school to the number of the pupils, and the Boards are now paid sums sufficient to cover the statutory salaries of their teachers; they also receive capitation of 11*s*. 3*d*. for general administration and local expenses, and 1*s*. 3*d*. for secondary scholarships, and variable smaller grants for other special purposes. Grants are also made for school buildings as before, but upon a much more liberal scale. About two thirds of the total income of the Boards is absorbed in the payment of teachers' salaries. The remainder forms the fund out of which the Board maintains its schools and other buildings, pays the salaries of its inspectors and of its office staff, and grants certain allowances to the committees for fuel, cleaning, and incidental expenses, and for school libraries. The fund at the disposal of a Committee may be supplemented by donations and subscriptions, and by fines recovered for truancy. The sums granted to the Boards in 1906 for all purposes connected with primary instruction amounted to a total of £668,440, which is equal to a capitation of £5. 9*s*. 7½*d*. on the average attendance."

No fees are chargeable for primary instruction at the public schools. Neither members of education boards nor members of school committees receive any remuneration for their services.

The schools are open to all children between the ages of five and fifteen, and attendance is compulsory from seven to fourteen. The instruction is entirely secular, though religious instruction may, with the consent of the committee, be given in the school building out of school hours. The subjects of instruction are reading, writing, arithmetic, English grammar and composition, geography, history and civic instruction, moral instruction, nature-study and elementary science, drawing, vocal music, the principles of health, physical and military drill, handwork, and, for girls, needlework.

Free passes by rail are given to pupils not over fifteen years of age traveling to attend schools for primary instruction, to pupils not over nineteen years of age who are holders of free places at secondary schools, to pupils on the rolls of primary or secondary schools traveling to attend classes for manual or technical instruction at centers specially equipped for the purpose, and, without restriction of age, to holders of free places at technical schools. Commutation and season tickets at liberal rates are given to other attendants at secondary and technical schools.

There is no public institution in the Dominion for the instruction of children under five years of age, but free kindergartens have been established by private promoters in some of the largest towns. On attendance at such schools capitation is, by special arrangement, payable by the Government at the rate of £2 per annum per unit of average, subject to certain conditions which provide for a minimum limit in salary payments, and further require an equal sum to be furnished from other sources, *e.g.* from donations and subscriptions.

In the field of secondary education, there are twenty-eight high schools or colleges in the dominion, which in almost every case derive a part of their revenue from public reserves. At the end of 1906 these schools employed 154 resident and 54 visiting teachers, and had as pupils 2528 boys and 1742 girls. Schools for boys and girls are usually separate. Fees averaging eight to ten guineas a year are charged, but many free scholarships are allowed. In addition to these secondary schools of the more ambitious kind, there are also more than sixty public schools which have free high school departments.

Manual and technical instruction is advancing rapidly, the total government expenditure in this direction in 1906 being £63,255. There is a flourishing cadet system in connection with the public schools. There is a superannuation fund for teachers, to which teachers may subscribe if they please from 8 to 10 per cent of their salaries, in return for which they are entitled to a pension or superannuation amounting to one sixtieth of their total salaries paid during the years in which they have been contributors to the fund.

Higher education is conducted by a chartered University of New Zealand, which is an examining body to which four other institutions are affiliated, namely, the University of Otago, founded in 1869, at Dunedin; Canterbury College, founded in 1876, at Christchurch; Auckland University College, founded in 1882, at Auckland; and Victoria College, founded in 1897, at Wellington. By a curious system the University of New Zealand sends its final examination papers for degrees to be examined in the universities of the United Kingdom.

Native schools to the number of 100 are provided for the benefit of the Maoris in places where no public schools have been established by the boards. In 1906 these schools were attended by 2275 boys and 1899 girls. In 10 per cent of these children European blood predominates, and 10 per cent were Europeans.

Among the other public educational institutions of New Zealand are numbered an institution for the blind, another for the deaf and dumb, many public libraries subsidized to the extent of £3000 a year, and seven government industrial schools for the maintenance and education of destitute, neglected and criminal children. In 1906 there were on the books of these industrial schools 2075 children, only 681 of whom were resident, while others boarded out or were at service. Fuller information may be obtained from the official account of the *Education System of the Dominion of New Zealand*, issued by the Department of Education at Wellington. P. R. C.

NEW ZEALAND, UNIVERSITY OF. — See NEW ZEALAND, EDUCATION IN.

NEWBERRY COLLEGE, NEWBERRY, S.C. — A coeducational institution founded in 1832 at Lexington, S.C., as the Classical and Theological Institute of the South Carolina Synod. In 1856 the College obtained a charter with power to confer degrees and was removed to Newberry. From 1868 to 1877 the College was located at Walhalla, S.C. Preparatory and collegiate departments are maintained. The requirements for admission are eight units. The degrees of A.B. and A.M. are conferred. In 1912 the faculty consisted of fourteen members and the students numbered 255.

NEWCASTLE COMMISSION. — See PARLIAMENTARY EDUCATION COMMISSIONS; ENGLAND, EDUCATION IN.

NEWCASTLE-UPON-TYNE, ARMSTRONG COLLEGE, ENGLAND. — An institution founded in 1871, as the College of Physical Science, "to promote the education of persons of both sexes and the study and advancement of science, philosophy, literature, and the fine and mechanical arts or other kindred branches of learning." The College is an incorporated Society, registered under the Companies Acts, and all subscribers of certain amounts are styled Governors. To these are also added the peers and members of Parliament of the local counties. The College has ten representatives on the Senate of the University of Durham of which since 1909 it is an integral part. The following faculties are maintained: pure science; applied science; arts; letters. The College has a Marine Laboratory at Cullercoats, and directs the Northumberland County Council Agricultural Station. A Day Training Department is also maintained in connection with the Board of Education. Work is given in day and evening classes to students over sixteen who have passed the matriculation examination of Durham University (*q.v.*) or some equivalent standard, if they wish to study for a degree. The College itself does not grant degrees, but the degrees of Durham University in science, letters, and in engineering are open to its students. The College grants diplomas in agriculture, engineering, naval architecture, and mining. The chemical, physical, and engineering laboratories, which are among the finest in England, give ample opportunity for practical work. The College receives grants from the Durham University, from many neighboring city and county councils, which also maintain many scholarships and prizes at the College, and from the Treasury, the Board of Education, and the Board of Agriculture and Fisheries. The enrollment of students in 1910 was 600 in the day and 475 in the evening classes with a faculty of sixty-one members.

See DURHAM UNIVERSITY.

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NEWELL, McFADDEN ALEXANDER (1824–1893). —Normal school principal and state superintendent; was educated at Queen's College, Belfast, and Trinity College, Dublin. He was professor in Baltimore City College (1848–1850), in Lafayette College (1850–1854), principal of the state normal school of Maryland (1865–1868), and state superintendent of Maryland (1868–1893). He was the author of a series of school readers.

W. S. M.

NEWFOUNDLAND, EDUCATION IN. — The development of education in Newfoundland is similar to that of the eastern provinces of Canada (*q.v.*). The present system was organized by acts of 1874 and 1876, which rendered it completely denominational. The public schools are in charge of three separate boards representing the three religious denominations: Methodist, Episcopalian, and Roman Catholic. The governor in council has power to appoint in each educational district a board of five or seven members of the respective denominations, on which the senior of superior clergymen resident or officiating in the district shall be one, to manage and expend all moneys, etc. Such boards in St. John's, and in districts in which are superior, or high, schools, may consist of nine members. Vacancies occurring by death, resignation, or absence from the colony for twelve months may be filled by the governor in council. Similar boards are appointed in like manner for the four colleges, but the nomination of members is with the respective denominations. Each denomination has a general superintendent of education to which the corresponding boards make their annual reports.

The education boards have control of their respective schools, appoint the teachers, determine the salary, tenure, etc. The course of instruction in public schools is arranged for six grades or standards, sectarian teaching is allowed, but the rights of dissenting minorities are protected by a conscience clause in the school law. By the act of 1874 $40,000 was provided for schoolhouses and school property and arrangements made for subdivision of property on an equitable basis, which was in due course accomplished without difficulty. By the 1876 act $88,252 was annually provided for all purposes, which amount has been increased, from time to time, according to increase in population. The government grant is divided among the school boards on the basis of a specified rate per capita of the attendance in their respective schools. The attendance at board schools in 1907 was 48,311 distributed as follows: Church of England, 14,983; Roman Catholic, 14,721; Methodist, 13,092; others, 1015. The total expenditure, including government grants and fees, was $281,655. Additional grants are made in aid of poor districts, for high schools, and for the support of colleges.

The high schools prepare pupils for admission to the colleges, in which provision is made for teaching advanced classes in ordinary commercial subjects, in Latin, Greek, French, German, algebra, geometry, mensuration and land surveying, chemistry, magnetism and electricity, free-hand and geometrical drawing, trigonometry and navigation, shorthand, music, and school management. In fact the colleges perform the double function of business colleges and classical colleges. They are all under government inspection, and reports of their condition and progress and a detailed account of income and expenditure must be transmitted by their respective superintendents to be laid before the legislature, in accordance with prescribed forms. Students who complete the prescribed courses are prepared for matriculation in the Dominion universities.

A. T. S.

NEWMAN, JOHN HENRY (1801-1890). — Divine, and educational writer, born in London, 1801, the son of a banker said to have been originally of Dutch extraction and possibly of Jewish descent. His mother belonged to the Huguenot family Fourdrinier. He was brought up from a child to take great delight in reading the Bible. At the age of seven, he was sent to a well-known private school kept by Dr. Nicholas at Ealing. In his childhood the *Waverley Novels*, then appearing, and Scott's poetry had a great influence upon his imagination, which dwelt much upon magical powers, talismans, and other mysterious influences. At fourteen he read Tom Paine's *Tracts* against the Old Testament and found pleasure in thinking of the objections contained in them. He also read Hume's essays and remembered copying out some French verses against the immortality of the soul and saying to himself, 'How dreadful, but how plausible.' In 1816 a great change of thought took place in him and he fell under the influence of the Christian faith, receiving into his intellect impressions of dogma never afterwards effaced or obscured. Calvinist preaching and sermons helped in this conversion.

Newman went into residence at Trinity College, Oxford, June, 1817, becoming a scholar in 1818. In 1819 his father's bank stopped payment, and in the same year he took a Second Class in the Final Schools. After graduating B.A. Newman took some private pupils in Oxford and was elected a Fellow of Oriel College, April 12, 1822. At Oxford Newman came under the influence of John Keble, Hawkins, Whately, and Richard Hurrell Froude. In 1830 he definitely broke with the evangelical party and abandoned Calvinism. As a tutor of Oriel his mind was turned much to the theory and practice of education, the intimate connection of which with religious belief he strongly maintained. Newman's first public writing on education is found in his review of the works of John Davison (1744-1834), Fellow of Oriel College. During a visit to Sicily, 1833, Newman nearly died of fever. On his homeward journey in an orange boat, between Palermo and Marseilles, he wrote *Lead, Kindly Light*. The years 1833-1845 were full of momentous controversy on spiritual questions, ending in his reception into the Roman Catholic Church at Littlemore, near Oxford, October 9, 1845. After a visit to Rome he returned to England in 1847 with a commission from Pope Pius IX to introduce into England the use of the Oratory founded by St. Philip Neri, whose beautiful character and educational devotion especially attracted him. He established the Oratory in Birmingham and resided there for the rest of his life. In 1854 he went, at the invitation of the Irish Roman Catholic Bishops, to Dublin as Rector of the then recently established Catholic University. The University was, however, a failure, partly through lack of State recognition and partly through Newman's own incapacity for organization. But his experience at Dublin flowered in the publication of his *Discourses on University Teaching,* issued subsequently under the title of *The Idea of a University Defined and Illustrated.* In these discourses occurs the famous passage in which Newman says that if he had to choose between two University courses, one non-residential but intellectually exacting, the other residential but intellectually disorganized, he would without hesitation give preference to that University which provided no teaching but brought together into personal companionship " a multitude of young men keen, open-hearted, sympathetic, and observant, gaining for themselves new ideas and views, fresh matter of thought, and distinct principles for judging and acting day by day. Such a youthful community embodies a specific idea, . . . administers a code of conduct, . . . furnishes principles of thought and action. It gives birth to a living teaching . . . which in course of time takes the shape of a self-perpetuating tradition or a *genius loci,* . . . which haunts the home where it has been born and which imbues more or less and one by one every individual who is successively brought under its shadow " (Discourse VI). The school for boys conducted at the Oratory in Birmingham under Newman's presidency has done educational work of high value. In 1879 Newman was created Cardinal, with the title of St. George in Velabro. He died at Edgbaston on August 11, 1890. M. E. S.

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NEWMAN, SAMUEL PHILLIPS (1797–1842). — Principal of one of the first American normal schools; was graduated at Harvard College in 1816. He was a private tutor for two years in Kentucky, and from 1818 to 1839 he was a professor in Bowdoin College. He was elected principal of one of the first of the Massachusetts normal schools organized by Horace Mann in 1839. The school was located at Barre but later removed to Westfield. This post he held until his death. His publications include a rhetoric, which passed through sixty editions, a textbook on political economy, and a series of school readers.
W. S. M.

NEWNHAM COLLEGE, CAMBRIDGE, ENGLAND. — An institution for the higher education of women. In 1871 Miss A. J. Clough (*q.v.*) took a house at Cambridge for five women students who wished to attend lectures there. The number grew rapidly, and in 1875 Newnham Hall was opened. Through the combined efforts of the authorities of Newnham Hall and the Association for Promoting the Development of Higher Education for Women (f. at Cambridge in 1873) Newnham College was established in 1880. The College now comprises the following buildings: Old Hall (1875), Sidgwick Hall (1885), Clough Hall (1889), Pfeiffer Building (1893), Kennedy Building (1906). The second of these Halls was named in honor of Professor Henry Sidgwick who played an important part in promoting the higher education of women and in the founding of the College. Like Girton, Newnham College has had a very prominent place in the history of women's education in England. The enrollment of students in 1910–1911 was 213.

See Women, Education of.

NEWSPAPERS AND PERIODICALS, COLLEGE AND SCHOOL. — More than 400 newspapers and periodicals are regularly issued at colleges and universities in the United States. If to this number there be added the number of newspapers and periodicals issued by the high and elementary schools and the number of high school, college, and university yearbooks or annuals, which are more or less journalistic in character, the total number would exceed a thousand. The list of publications includes dailies, semiweeklies, weeklies, monthlies, bimonthlies, and quarterlies. It includes periodicals which are devoted to literature with no admixture of news, and periodicals which are devoted entirely to news, others that publish news and literature, and yet others, treating the lighter side of college life, that are devoted to humor. Many of these publications are illustrated. Most of them are financially profitable. They are to the undergraduate world what the daily or weekly newspaper is to the world outside the colleges. They give the news of the college campus and comment upon it.

The college or school newspaper is generally issued by the students, under some form of faculty supervision or control. In a few cases it is issued directly by the faculty representing the institution. The students, through their own organization, incorporated or otherwise, select the editors and reporters. In most institutions, the editorship of the newspaper or magazine is regarded as one of the highest honors which the undergraduate may attain. Often the selection of associate editors and reporters is by competition, and there are many more applicants than there are positions to be filled. In some institutions, academic credit is given for such activities; and in others the higher editorial positions usually are accompanied by special society or college honors.

The college publications are not new in America. The earliest appeared at Dartmouth with Daniel Webster as editorial writer. The college daily came later. The Cornell *Daily Sun* was the first issued by an incorporated organization. Now daily newspapers are published at all the larger universities.

Students who plan to enter journalism (*q.v.*) or literature usually seek positions on college journals. Where courses are given in journalism the college journals afford a laboratory for students taking such courses.

W. W.

England. — There are few secondary schools in England that cannot boast of at least one official school magazine, published as a rule once a month during the school year. From time to time other sheets raise their diminished heads, either as representatives of special interests, of a special group, or of some form of the school. But these rivals rarely come to maturity, for not uncommonly they depend for their existence on the enthusiasm, lively but evanescent, of a few boys. Even the recognized school magazine frequently varies in quality, through the changing and shifting character of its staff. As a general rule the school magazines in England are conducted almost wholly by a committee of masters and boys or of boys alone under the general and benevolent supervision of a master. The content and arrangement are in most cases the same: occasional notes, honors and distinctions, news of old boys, a poem or two (in modern or classical language, original or translated), a few articles by present or old boys, and reports of school activities (different school societies, and athletics). A charge is invariably made for the magazine. Many school efforts have been wrecked on this financial rock, but compulsory subscriptions or advertising matter have been called in to aid. Within recent years the school magazine has tended also to become the official organ of old boys' associations, and in this way the list of subscribers is substantially increased.

The history of school publications is recent, even in the oldest schools. Occasional efforts appear to have been made at the beginning of the nineteenth century to launch school papers but rarely with success. The causes are not far to seek; the cost of printing must have been high, and corporate school spirit as it is now understood was perhaps only in the early stages of its development. But here and there boys who not infrequently made their mark later in the literary world would seek to give rein to their genius while still at school. At Eton the earliest recorded magazine was the *Microcosm*, edited in 1786 by George Canning, John Smith, Robert Smith, and John Hookham Frere. The next publication in 1804 was the *Miniature*, of which thirty-four numbers were issued in twelve months. After an interval of a few years there appeared, about 1818, a number of manuscript publications, all of which were shortlived. In 1819 appeared perhaps the most famous of Eton magazines, the *Etonian*, in the management of which W. M. Praed was the leading spirit. Many of Praed's contributions attracted considerable attention. The *Eton Magazine*, which appeared in 1827, is notable mainly for the fact that W. E. Gladstone was one of the editors. After a desultory period of nearly thirty years another crop of ephemeral magazines appeared, the *Adventurer*, which lasted from 1867 to 1872, being the longest lived. Most of the publications, however, were hardly school magazines in the sense described above. They aped or imitated the literary reviews of their day and afforded for many years an opportunity for the boys to exercise their literary ability in the vernacular before English composition became a school subject. The first grammar school magazine — a record of school activities — was the *Eton College Chronicle*, which appeared in 1863 and has continued up to the present. At Harrow the first magazine, the *Triumvirate*, appeared in 1859; in 1863 its title was changed to the *Tyro;* in 1869 it was again changed to the *Harrovian*, and from 1883 to 1888 was published outside the school under the title *Harrow Notes*. In 1888 the magazine was again restored to the school, and since that time the *Harrovian* has been the recognized school organ. At Rugby the earliest publication was the *Rugby Magazine* (1835), mainly a literary work, followed ten years later by the *Rugby Miscellany*, containing essays and poems, giving occasional glimpses of school life and Arnold's work. The *New Rugbeian*, which appeared in 1858, ran through three volumes. Other ephemeral magazines at Rugby have been the *New Rugby Magazine* (1864–1865), the *T. V. W.* (1877–1878), the *Leaflet* (1883–1886), and *Sibyl* (1890–1895). The *Meteor*, the first paper which claimed to be nothing more than a chronicle, appeared in 1867 and is still flourishing. At St. Paul's School, London, a magazine, *Hermes*, appeared before 1832, but little is known about it. About the same time (1831), showing how readily a stimulus works in school, appeared the *Pauline*, which died an early death, was revived for a short time in 1836, and again in 1882, since which time its existence has been unbroken. As in other schools the *Pauline* has had to face upstart competitors, but these have not been able to survive the departure of their editors from the school.

It thus appears that the essential qualities of a newspaper are not the literary productions but the appeal to the generality; school news and full reports of school activities, liberally interspersed with the names of youthful aspirants to distinction, are the means to assured success. A few magazines of other prominent schools may be mentioned: Charterhouse, *Carthusian* (1872); Shrewsbury, *Salopian* (1834, 1860); Winchester, *Wykehamist* (1866); Westminster, the *Elizabethan;* Merchant Taylors, the *Taylorian;* Bedford, the *Ousel;* Bradford, the *Bradfordian;* Cheltenham, the *Cheltonian;* Clifton, the *Cliftonian;* Marlborough, the *Marlburian;* Manchester, *Ulula;* Rossall, the *Rossallian;* Sedbergh, the *Sedberghian;* Tonbridge, the *Tonbridgian.*

See STUDENT LIFE; JOURNALISM, EDUCATION IN; also PUBLIC SCHOOL, etc.

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NEWTON, SIR ISAAC (1642–1727). — One of the greatest of the world's mathematicians and physicists. He was born in humble circumstances, and as a boy was rather backward in his studies. He lived on a farm, and the surroundings were not conducive to serious study. He had an uncle who agreed to send him to college, and so he prepared for entrance and was admitted to Trinity College, Cambridge, in 1660. Within six years after entering the college he had proved the binomial theorem for the general case, laid the foundations of the calculus, and begun his great work on the study of the attraction of planets. Newton seems to have found the principles of the calculus in or before the year 1665. (See CALCULUS.) In 1667 he became a Fellow of Trinity College, and in 1669 he became Lucasian professor of mathematics, being then less than twenty-seven years old. His greatest works are the *Principia* (1687), *Optics* (1704), *Arithmetica Universalis* (1707), *Analysis per Equationes Numero Terminorum Infinitas* (1711), *De Mundi Systemate* (1728), and *Optical Lectures* (1728, posthumous).

He also contributed many memoirs to the Royal Society from 1703 to the time of his death. He was knighted by Queen Anne in 1705. D. E. S.

NEWTON THEOLOGICAL INSTITUTION, NEWTON CENTRE, MASS. —An institution for the training of students for the Christian ministry in Baptist churches, founded in 1825. A course of three years leading to the degree of D.B. is offered to students who have already some college degree or its equivalent. Women who intend to devote themselves to missionary work are admitted to the lectures. In 1907 the Gordon Bible and Missionary Training School of Boston, founded in 1889, was consolidated with the Theological Institution as the Gordon School. A summer school is also conducted by the Institution. The faculty consists of nine members and there is an annual enrollment of about seventy-five students.

NIAGARA UNIVERSITY, NIAGARA FALLS, N.Y. — An institution located on the New York bank of Niagara River, founded in 1856 and conducted by Priests of the Congregation of the Mission, a body of religious educators established in seventeenth century by St. Vincent de Paul. Chartered as the Seminary of Our Lady of Angels in 1863, the institution was erected into a college as Niagara University by the Regents of the State of New York in 1883. The physical plant includes a campus of 300 acres, a group of buildings, including a museum, scientific laboratories, auditorium, literary society parlors, and a library of 35,000 volumes. It offers full college courses, and, in addition, has a theological seminary. The President is Very Rev. Edward J. Walsh, C.M. E. J. W.

NICARAGUA, EDUCATION IN. — Nicaragua, the largest of the Central American Republics, extends over an area of 49,200 square miles and has a population of 600,000 (estimated, 1910). About one third of this population is comprised in 13 towns, of which the largest is Leon, the former capital, having a population of 62,500. The present capital, Managua, has a population of 34,872. It is the center of the country's activities and exercises wide influence through its daily papers, morning and evening issues. The mass of the population consists of aboriginal Indians, negroes, and mixed races. The Europeans and their descendants are estimated at less than 2000. The prevailing religion is the Roman Catholic, the entire country forming one diocese under the Bishop of Leon, a suffragan of the Archbishop of Guatemala. The country is organized in thirteen departments and two comarcas, each under its own executive who has independent management of its internal affairs. The president of the Republic is assisted by a cabinet of ministers, one of whom is charged with the interests of public instruction. His authority in this matter, however, is limited by the independence of the departmental chiefs. He may require reports from each department as a basis for the distribution of the government appropriations for schools, but beyond this he has little more than advisory functions.

In a recent report, the minister of public instruction deplores the low condition of primary education in the Republic. Five times as many schools as have been provided, he declares, are required in order to meet the actual needs of the population. There are about 350 primary schools, enrolling 23,000 pupils or less than 4 per cent of the population.

For secondary instruction there are four subsidized schools; namely, for boys, three, situated respectively in Managua, Leon, and Granada, and a normal school for young women in Managua. These schools enroll about 900 pupils and for each the State pays at the rate of $5 a month. Private secondary schools follow the same programs as the public, all non-classical. The course in the normal school includes methodology, pedagogy, Spanish, mathematics, zoölogy, botany, drawing, physical sciences, and singing.

Higher education is represented by two University faculties of law, and by a faculty of medicine and surgery. The law course is very comprehensive, including philosophy of law, civil, comparative, and constitutional law, criminal law and criminology, medical law, statistics, and academic courses in Spanish and American literature, in history and political economy. There is an agreement with the other Central American States by virtue of which degrees granted in any one of them are recognized in Nicaragua as of equal weight with its own. Possessors of degrees granted in foreign countries must pass a brief examination and prove the authenticity of their diplomas.

The chief educational influences now working in the Republic come from the increasing relations with the other Latin American States and with the United States, and the impetus thereby given to the commercial, agricultural, and mining industries of the country. An evidence of the growing desire for harmonious relations among the Central American States is afforded by the appointment of a committee to draw up a manual of civic instruction adapted to each one.

The national museum of commerce and industry at Managua illustrates the increasing interest in the conditions that make for economic prosperity. A. G. S.

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U. S. Bur. Educ., *Rep. Com. Educ.* 1910, Vol. I, Ch. IX. (Washington, 1910.)

NICOLAUS VON CUSS (NICHOLAS OF CUSA, NICOLAUS CUSANUS). — A fifteenth century scholar and writer. He was born at Kues on the Mosel in 1401, and died at Todi, in Umbria, August 11, 1464. One of his biographers has thus tersely summed up his position: " Nicolaus wished to be a medieval philosopher, but with more liberty; he was, without wishing it, a modern philosopher, but with more reserve." His name was Nicolas Chrypfs, and he was son of a humble fisherman. In the patois of the Mosel valley, Chrypfs is the same as the German Krebs (crab) and hence he is known also by the Latin name of Nicolaus Cancer. He was educated at Heidelberg, and went from that university to Padua where, in 1424, he took the degree of doctor of laws. Returning to Germany, he made his first legal effort at Mainz, lost his case, and thereupon determined to devote himself to theology and science. In 1436 he presented to the Council of Basel a plan for reforming the calendar. So successful was he in diplomacy that Eugene IV, Nicholas V, and Pius II employed him on important missions, and in 1448 Nicholas elevated him to the position of cardinal, a very rare honor for a German in those days. Because of this unusual fact, he was known in Italy as Cardinalis Teutonicus. His works relate to questions of theology and metaphysics, the reform of the calendar, to the principles and value of mathematics, and to similar topics. Although not himself a teacher, by his writings he exerted a powerful influence upon the teaching of his day. His works had much to do with leading Leonardo da Vinci to maintain the theory of the plurality of worlds.

D. E. S.

NICOLE, PIERRE (1625–1695). — One of the most famous writers of Port Royal (*q.v.*). Among his more important works are: *Logique* (1662); *Essais de morale* (1671–), 25 vols., in the second volume of which occurs his *Traité de l'éducation d'un prince.*

F. E. F.

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NICOMACHUS. — The greatest writer on theoretical arithmetic among those whose works appear in Greek. He, however, was not a Greek, but a Jew. He was born at Gerasa, 50 A.D., and died about 111 A.D. His work is not that of a great mathematician, but is rather a compilation of the knowledge common to teachers of the subject in his time. The object of the book is the study of the properties of numbers, particularly as they had been studied by the Pythagoreans for some centuries, and as they were being taught by the neo-Pythagoreans in his day. For example, he classifies numbers as odd, even, prime, perfect, and so on, and studies with some care the various polygonal and solid numbers. Ratios, proportions, and progressions occupy considerable of his attention. From his work Boethius (*q.v.*) derived much of the material for his textbook on the subject, a book that for a thousand years was the classic in theoretical arithmetic. His work was edited by Hoche, in 1866. D. E. S.

NICOMEDES. — See GEOMETRY.

NICOTINE. — See TEMPERANCE, TEACHING OF.

NIEDERER, JOHANNES (1778–1843). — Swiss educator and one of Pestalozzi's assistants. Educated and trained for the ministry, Niederer heard of Pestalozzi's work about 1800, resigned his pastorate at Appenzell and joined Pestalozzi at Burgdorf, where he had special charge of religious instruction. In this field he showed exceptional ability. But he was interested also in language and literature and in the broader social and philosophical aspect of education. He became indispensable to Pestalozzi as adviser and collaborator in his writings, and edited much of the latter's work between 1807 and 1811. But with a scientific and philosophical mind such as he possessed Niederer was not suited to interpret Pestalozzi and later some of his additions and interpretations were repudiated. Niederer edited the *Wochenschrift für Menschenbildung* (1808–1812), *Das Pestalozzische Institut und das Publikum* (1811), *Pestalozzi's Erziehungsunternehmung im Verhältniss zur Zeitkultur* (1812–1813). The recall of Schmid, however, led to a breach between Niederer and Pestalozzi in1817 which continued until the latter's death. In 1828 Niederer wrote *Pestalozzische Blätter*. Niederer's wife, Rosalie Kastenhofer, conducted the girls' school established by Pestalozzi at Yverdun and removed in 1827 to Geneva, where a seminary was also opened for the training of teachers. Mme. Niederer was the author of *Blicke in das Wesen der weiblichen Erziehung. Für gebildete Mütter und Töchter* (*Glances at the System of Female Education. For educated mothers and daughters*, 1828), and of *Dramatische Jugendspiele* (*Dramatic Games for the Young*, 1838).

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NIEMEYER, AUGUST HERMANN (1754–1828). — German educator, born at Halle, a direct descendant of August Hermann Francke (*q.v.*), whose work he continued. His parents died while he was very young, and he was brought up by Frau Lysthenius, a lady of great culture and refinement. He received his early education in the schools founded by his great-grandfather, and at the age of seventeen entered the University of Halle, where he studied theology and philology. In 1775 he published his first work, *Charakteristik der Bibel*, which at once made his name known all over Germany. In this book he showed how to use the biblical characters for moral instruction. In 1777 he began his academic career at Halle; in 1779 he was made professor of theology, and in 1785 he was appointed one of the directors of the Francke Foundations. He infused new life into these institutions which had declined under his predecessor. In 1806, the university was closed by the order of Napoleon I, and Halle annexed to the Kingdom of Westphalia. Niemeyer not only lost his position, but together with some other citizens of Halle was forcibly removed to Paris, where he had to remain for several months. On his return he succeeded in his efforts to have the University of Halle restored and was placed at the head of the institution with the title of Chancellor and Perpetual Rector. He resigned this position in 1815, but remained active in lecturing at the University and in the administration of the Francke Foundations until his death.

Niemeyer's most important work is his *Grundsätze der Erziehung und des Unterrichts* (*Principles of Education and Instruction*, 1796; Ed. G. A. Lindner, Vienna, 1877–1878). It was highly recommended by such a competent authority as Herbart, who found in it "the whole summary of contemporary pedagogy and a broad and firm empirical basis for the theory of education." Up to the time of the author's death, nine different editions of this work had become necessary. F. M.

See HISTORY OF EDUCATION.

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NIETHAMMER, FRIEDRICH IMMANUEL (1766–1848). — A German schoolman born in Beilstein, near Heilbronn, Württemberg, studied philosophy and theology at the University of Tübingen, then lectured at the University of Jena, where he became acquainted with Schiller, Goethe, and Fichte. In 1804 he was appointed professor of theology at the University of Würzburg, and in 1808 he was called to Munich to assist in the reform of the Bavarian gymnasia. In 1817 he became a member of the board governing the Protestant churches of Bavaria (*Oberkonsistorialrat*) and devoted the rest of his public activity to ecclesiastical affairs.

Niethammer is best known as the author of the essay *Der Streit des Philanthropinismus und Humanismus* (*The Conflict of Philanthropinism and Humanism*, Jena, 1808) in which he defended the claims of the classical studies against the realistic studies favored by the Philanthropinists (*q.v.*). F. M.

NIETZSCHE, FRIEDRICH WILHELM (1844–1900). — German philosopher born at Röcken, Germany. He received his preliminary education at Naumburg, and in 1864 entered the University of Bonn as a student of philology and theology, the latter of which he discontinued at the end of the first semester. After a year at Bonn he went to the University of Leipzig, where he spent the greater part of four years, and where he busied himself with philosophy as well as with philology. In 1869, upon the recommendation of the distinguished philologian Ritschl (*q.v.*), he was appointed to the professorship of classical philology at Basel; and the University of Leipzig at once made him a doctor of philosophy without a thesis or examination. The next ten years were devoted largely to the work of teaching. In 1879 ill-health forced him to resign his position and to go from one health resort to another. In 1889 he became hopelessly insane, and lived at his sister's home in Weimar until his death, August 25, 1900. His principal writings are *Die Geburt der Tragödie* (*The Birth of Tragedy*), 1872; *Menschliches allzu Menschliches* (*Human all too Human*), Vol. I, 1878, Vol. II, 1879 and 1880; *Also Sprach Zarathustra* (*Thus spake Zarathustra*), first complete edition, 1892; *Jenseits von Gut und Böse* (*Beyond Good and Evil*), 1886; *Zur Genealogie der Moral* (*The Genealogy of Morals*), 1887; *Götzendämmerung* (*The Twilight of the Idols*), 1889.

Although Nietzsche's writings are classed under the general heading of philosophy, they do not belong there in any technical sense of the term. He did not write systematic treatises, but devoted himself to the construction of brilliant aphorisms, and thus could discuss in quick succession subjects widely separated from one another. During the years of his creative activity his standpoint underwent frequent changes, but everywhere there may be found one unifying principle. Nietzsche's philosophy is always a philosophy of culture, as it presents itself to the man of marked aristocratic tendencies. The central problem is that concerning the nature of the ultimate good. If life is worth living, what makes it so? What is the supremely valuable? During his first period Nietzsche found the justification of the world, if it has one, in the æsthetic concept of beauty; then his standard of valuation became positivistic and he subjected everything to the intellectual test, rejecting much of what is usually regarded as true; finally he came to question the validity of the concept of truth itself, and the only valuation left him is ethical in nature. Although the writings of the first and second period offer much that is interesting and suggestive, Nietzsche's most characteristic theories are to be found in the books published after 1882. In them he preaches a "transvaluation of values," condemning the present-day morality as that of slaves and exalting all the qualities belonging to self-assertion. The ultimate reality in the universe and the chief good for the individual is the will for power. Nietzsche makes no attempt to show that all human actions and feelings are at bottom selfish. He admits the existence of disinterestedness and deplores it. All history and all social organization find their one justification in the production of a few great personalities, whose one aim is the attainment of power rather than of happiness. Egoism is not so much a fact as an ideal. Closely connected with the possibility of its realization is the doctrine of the Superman, which presents both mystical and evolutionary scientific elements. The Superman is related to man as man is to the ape; and man should be glad to give place to his own superior, the incarnation of the egoist's ideal. As a means to its attainment every kind of struggle and difficulty should be increased and intensified. "A good war sanctifies every cause."

Although during the entire course of his literary activity Nietzsche occasionally wrote upon the subject of education, always advocating cultivation rather than learning, his views have not met wth much attention and present no great originality. His real influence, which has been almost unparalleled in his own country and in other parts of Europe, is due rather to his general position. He is the philosopher of revolt. He encourages opposition to religion, to the accepted morality, and to intellectual and social customs and traditions. Self-assertion is the first duty of man; and with this end in view, education must be so remade as to encourage rather than to stifle the few great personalities. How can we hope for a Cesare Borgia or a Napoleon, if we teach and enforce commonplace standards? G. N. D.

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NIGER. — See French Colonies, Education In.

NIGHT SCHOOLS.— See Evening Schools.

NIGHTMARE. — A dream (*q.v.*) of a fearful or horrible nature supposed to be due to abnormal cerebral stimulation. These often have the nature of a phobia (*q.v.*, also Fear). These are always contributary evidence of a disordered nervous system, and are of great importance in the elucidation of nervous conditions in childhood. They are found principally in epilepsy (*q.v.*), hysteria (*q.v.*), and neurasthenia (*q.v.*). The nightmare may be replaced by *pavor nocturnus,* in which the dream ideas are lacking, and the child has only a vague fear or apprehension, but wakes shouting or screaming and is pacified with great difficulty. S. I. F.

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NISIBIS, SCHOOLS OF. — See Catechetical Schools.

NOBILITY, SCHOOLS OF. — See Chivalric Education; Fürstenschulen; Gentry and Nobles, Education of.

NOISE. — Noises may be said to be blurred tones. They correspond to aperiodic vibrations, and are classified as simple and compound. A simple noise is due to a momentary and irregular set of vibrations, for example, a tap, a flick, a thud, a click, etc. A compound noise is made up of repeated simple noises, usually in connection with tonal elements, *e.g.* the hiss, the roar, the rumble, the rattle, the crash, and the murmur. Many of the laws of tone sensations apply also to sensation of noise. C. E. S.

NOISE-PROOFING IN SCHOOL BUILDING. — See Architecture, School.

NOMENCLATURE. — The technical terminology relating to any subject. See Terminology.

NOMINALISM. — See Ideas, Ideation and Idealism; Idealism and Realism in Education; Middle Ages, Education in; Scholasticism.

NONCONFORMISTS IN EDUCATION. — See Dissenters in Education.

NON-DIACRITIC METHOD. — In teaching reading and spelling, more particularly the former, diacritical marks have been much used in dealing with phonetic difficulties. Phonetic methods which depend upon the analysis and synthesis of sound units by means of syllables, phonograms, and word wholes, to the complete elimination of all artificial marks and symbols, have been called non-diacritic methods. They represent a naturalistic tendency in instruction which constantly finds increased acceptance among progressive teachers. H. S.

See Diacritic Method.

NON-EUCLIDEAN GEOMETRY. — The geometry of Euclid (*q.v.*) contained a certain postulate (sometimes known as the fifth postulate and sometimes as the twelfth axiom) to the effect that only one line could be drawn through a given point and parallel to a given line. The postulate read as follows: "That, if a straight line falling on two straight lines make the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which are the angles less than the two right angles." The postulate was apparently very unsatisfactory to Euclid himself, for he avoids using it whenever possible. Numerous efforts were made by his successors to prove it, but no really scientific attempts to investigate its validity were made until Saccheri (1773), an Italian Jesuit, endeavored to prove it by a *reductio ad absurdum.* In attempting to show the absurdities that would follow if the postulate were not sound, he really developed, without appreciating it, a body of theorems that would be valid if the postulate were not accepted. Lambert, in a posthumous work of 1786, questioned the validity of the postulate. A little later, Gauss (*q.v.*) became interested in the question, but not until after others had set forth the real problem involved did he seriously attempt to consider it. The credit of definitely asserting that the fifth postulate is not in the same category as the others, and of building up a geometry based upon its opposite, in other words a "Non-Euclidean Geometry," is due to Johann Bolyai (1802–1860) and Lobachevsky (1793–1856). Bolyai was a Hungarian mathematician, and his ideas on the subject appear in brief in a letter written when he was only twenty-one years of age, that is, in 1823. Lobachevsky (*q.v.*) was apparently working on the theory at the same time, and entirely independently of Bolyai. Bolyai committed his theory to writing in 1825 and published it in 1832. Lobachevsky did not publish his work until 1835. The subject first attracted widespread attention in the publication of Riemann's memoir in 1854, in which he distinguished two kinds of non-Euclidean geometry, namely, the Bolyai-Lobachevsky type and his own. To these Klein (1871) gave the names of Elliptic (Riemann's) and Hyperbolic (Bolyai-Lobachevsky's), Euclid's geometry being called Parabolic. In Euclid's geometry the sum of the angles of a triangle is two right angles; in the Hyperbolic geometry it is less than two right angles, and in the Elliptic geometry it is more. All three geometries are entirely self-consistent and are logically valid. Within the limited space in which we work there is no practical difference in results, but in the domain of abstract mathematics the various geometries lead to conclusions that are widely different. D. E. S.

See Geometry; Lobachevsky; Parallels.

NON-METHOD READERS. — Reading books for children which are graded merely with reference to their literary content, disregarding phonetic and spelling difficulties, are called "thought" or "non-method" readers. H. S.

See Basal Readers; Method Readers.

NORM. — See Statistical Method.

NORMAL ART SCHOOLS. — See Art Education.

NORMAL CLASS IN HIGH SCHOOLS. — See High School Normal Class.

NORMAL COLLEGE OF THE CITY OF NEW YORK. — Established February 1, 1870, and received its charter from the state in 1888. Thomas Hunter, LL.D., was its first president. It is a college for women and grants the degree of A.B. upon the satisfactory completion of a four years' course of study. It is supported by the city of New York with annual appropriations, that for 1912 being approximately $400,000. Tuition and textbooks are furnished without charge. Students must be residents of the city.

Admissions and graduations are made twice a year. Candidates for admission must present fifteen units. The curriculum is arranged according to the elective group system and provides strong optional courses in education for those students who desire to enter the profession of teaching in either secondary or elementary schools. The equipment of the College is being renewed, and new buildings are being erected at a cost of $2,500,000. The students number about 1250. The teaching staff comprises thirteen professors, ten associate and assistant professors, and seventy-one instructors. A high school and an elementary school, which are distinct and separate organizations from the College, serve as model and practice schools for students intending to teach. George Samler Davis, LL.D., is the president. G. S. D.

NORMAL SCHOOL. — An institution for the preparation of candidates for the teaching profession. The English term is borrowed directly from the French *école normale.* In 1794 (Oct. 30) the Convention decided to create in Paris "an *École Normale* where citizens of the Republic already instructed in the useful sciences should be taught to teach." The course was to last five months and the students were to return to their own districts and there open other normal schools. The school was opened on Jan. 20, 1795, and closed on May 15 of that year. Lagrange, Laplace, Berthollet, and Bernard in de Saint-Pierre were on the faculty. *Écoles normales* became the established name for the institutions for the training of teachers. The term was transferred to England in the thirties. In 1833 Roebuck (*q.v.*) urged the importance of creating "normal schools" for training masters, and in a Minute of Committee of Council of 1839 the establishment of a national normal school was advocated: "to found a school in which candidates for the poorer classes may acquire the knowledge necessary to the exercise of their future profession, and may be practiced in the most approved methods of religious and moral training and instruction." The scheme fell through, however, owing to the opposition of the National Society and the British and Foreign School Society.

The importance of professional training of teachers had received sporadic attention in the United States from the latter part of the eighteenth century. The numerous academies (*q.v.*) which formed so conspicuous a part of the educational system of the times included in their function the preparation of teachers, so far as they were prepared. In the charter of the very first of these institutes, the "Academy and Charitable School of Philadelphia in Pennsylvania" the training of a number "of the lesser sort" as teachers was specified as one of its functions. With academies the training of teachers was incidental and could hardly be termed professional; at least not until after the adoption in 1834 of the New York system of dividing portions of the state funds among the academies for this specific purpose. When the importance of special professional training began to be recognized, the term teachers' seminaries was applied to the institution which was advocated, though academy for teachers was also used. With the publication in translation of Cousin's (*q.v.*) *Report on the State of Public Education in Prussia* in 1834 and Calvin E. Stowe's (*q.v.*) *Report on Prussian Schools* in 1837, the use of the term Normal School as distinctive becomes quite general, though it is not used in the report nor in the statutes framed by the Massachusetts legislation committee in 1838, which resulted in the first normal school in the United States. The term, however, was applied to the resulting institutions, opened at Lexington (later at West Newton), 1839, at Barre (later at Westfield) and at Bridgewater in 1840. The New York Normal was established in Albany in 1875, the Pennsylvania one at Philadelphia in 1848, the Connecticut one at New Britain in 1849, and the Michigan one at Ypsilanti in 1850. The entire subject is discussed under the caption Teachers, Training of.

NORMAL SCHOOL OF THE CONVENTION. — See France, Education in; Normal Schools.

NORMAL SCHOOLS, JUNIOR. — See Junior Normal Schools.

NORTH CAROLINA COLLEGE OF AGRICULTURE AND MECHANIC ARTS, RALEIGH, N.C. — Founded in 1889. It is one of the land grant colleges provided for in the Morrill Act of 1862, and is therefore a federal as well as a state institution. The college offers degree courses in agriculture, civil engineering, mechanical engineering, electrical engineering, chemistry, and textile industry. The enrollment has reached 630 students, 240 of whom are in the agricultural courses. It has 587 graduates. The college owns about four hundred acres of land, a mile and a half west of Raleigh. The buildings number nineteen, and, with the farm, aggregate in value $850,000. E. B. O.

NORTH CAROLINA STATE NORMAL AND INDUSTRIAL COLLEGE, GREENSBORO, N.C. — Was established in 1891 by the State for the higher education of the white women. It is supported by legislative appropriation. The board of directors is appointed by the State Board of Education. Tuition is free to those who agree to teach two years in the state. The usual undergraduate courses are offered leading to the bachelor's degree in arts, science, pedagogy, music, and home economics. Admission is by certificate of an accredited high school or by examination. The Faculty, including instructors, numbers sixty-five; total number of students is 650. Extension work in elementary agriculture, education, and home economics, is conducted by lectures, correspondence, bulletins, and field work. There are fourteen buildings on a campus of 100 acres, valued at $650,000. The annual state appropriation is $87,000. J. J. F.

NORTH CAROLINA, STATE OF. — One of the thirteen original states, having ratified the Federal Constitution in 1789 as the twelfth state. It is located in the South Atlantic Division, and has a land area of 48,740 square miles, or about the same size as the state of of New York. For administrative purposes the state is divided into ninety-eight counties, and these in turn into cities, towns, and rural school districts, though the township as an intermediate government unit is also used in a number of the counties. In 1910 North Carolina had a total population of 2,206,287, and a density of population of 45.3 persons per square mile.

Educational History. — Educational development in the colony was slow, owing to bad government and the slow growth of population. The first professional teacher, Charles Griffin, opened a school in Pasquotauk county about 1705. In 1708 this school was turned over to a representative of the English Society for the Propagation of the Gospel (*q.v.*). In 1712 a school was opened at Sarum, and the Society sent over a number of parish libraries. Little was done under the proprietary form of government, which ended in 1729, or under the earlier period of royal control. In 1736 the colonial Governor urged the establishment of schools in his message, but no action was taken. At that time the colony did not possess either a printing press or a printed edition of its laws, and schools were naturally not regarded as important. In 1745 the first school law was enacted. This merely granted to the town of Edenton the right to build a schoolhouse by means of donations and subscriptions, but there is no evidence that it was ever built. School laws were proposed in 1749 and 1752, but were refused passage. In 1754 George Vaughan, a London merchant, proposed to give to the colony £1000 to propagate the Gospel among the Indians. This was met by a counter-proposal, that if changed to a public school or a seminary of learning, the colony would add £6000 to the bequest. This was done that year, but soon after the fund was spent for defense in the French and Indian War, and the plan came to naught. In 1766 an act incorporating a Society for Promoting and Establishing the Public School in Newbern was passed. This was practically the first law passed in the province for the encouragement of public education. Trustees were to be chosen, their duties specified, and a duty of one penny a gallon on all liquors imported into Neuse River was levied for the next seven years, to provide free education at the school for ten poor children. The teacher was to belong to the Church of England, and to be licensed by the Governor. In 1767 and 1768 similar bills to establish a school in Edenton were passed, but vetoed because the assembly refused to require the teacher to be a member of the Church of England. In 1771 the people accepted this condition, and a school was established. Only English Church schools, either public or private, were allowed in the colony during the period of English control. All schoolmasters were required to be licensed by the Bishop of London, to conform to the Anglican liturgy, and to have received the Sacrament in some Anglican Church within a year, under penalty of three months' imprisonment; a similar penalty and perpetual disbarment from teaching was imposed for attending any other form of worship. This law was enforced in the eastern part of the state, which was largely English, but in the western part, where there were many settlements of Germans, Scotch, Scotch-Irish, and Quakers, many parochial schools were established in connection with their churches. Presbyterians from New York and Pennsylvania, and graduates of Princeton College not only gave an impetus to elementary religious instruction, but also began the founding of the academies which later were such a marked feature of education in the state. Tate's Academy at Wilmington, established about 1760, was the first. Crowfield Academy, Caldwell Academy, Poplar Tent Academy, Clio's Nursery and Academy of the Sciences, and Queen's College (afterwards Liberty Hall Academy) were established before the Revolution.

In 1776 the state adopted its first constitution, and in this was incorporated a provision, copied from the Pennsylvania constitution, directing that a school or schools should be established by the legislature, " with such salaries to the masters, paid by the public, as may enable them to instruct at low prices;" and that all useful learning should be promoted " in one or more universities." In 1789 the University of North Carolina was chartered, and organized in 1795, but no action was taken toward the establishment of public schools until 1816. Private academies were chartered, however, in numbers. By the close of the eighteenth century, legislative charters had been granted to thirty-two academies; up to 1810 to seventy; by 1815 to 102; and by the close of 1825 to 171. The earlier academy charters were almost all alike. A number of individuals were given corporate powers, and absolute control over the establishment and management of the academy. In the earlier charters it was specified that such schools were not to be considered as the institutions of learning provided for in the constitution. Freedom from taxation and the right to raise money by a lottery were sometimes given. The first school society for the education of females was chartered in 1811. After about 1815, the stock company form of charter appeared, and library societies and benevolent educational societies also began to be chartered.

In 1804, 1806, 1811, 1815, and 1816 the different governors recommended to the legislature that they make some provision for the education of the people, but it was not until 1816 that the legislature took any action. The result was the adoption of a resolution, authorizing the appointment of " three persons to digest a system of public instruction, . . . and to submit the same to the consideration of the next general assembly." This was done, and the plan submitted to the legislature of 1817. It provided for the creation of a state School Fund; a Board of Public Instruction to manage the fund and carry the plan of public instruction into execution; a system of schools, embracing primary schools, academies, and the state university; outlined the course of instruction, the method of instruction, and the form of school government; provided for the free education of all poor children in the primary schools, and for the brightest in the academies and the university; and for an asylum for the education of the deaf and dumb. The expense involved made the plan prohibitive; its friends demanded its adoption entire or not at all; and the result was no action. Nothing further was done until 1824, when a new commission was appointed to prepare a feasible plan. A bill providing for the education of the poor was the result, but it was not adopted.

In 1825 the beginning of a state school system was finally made, with the creation of the literary fund, and the beginning of an effort to carry out the mandate of the constitution of 1776 was made. It was not until 1839 that an elementary school system was finally provided for. The act of 1825 created a permanent fund, consisting of certain bank and navigation companies' stock held by the state, all liquor licenses and land entry fees, and the swamp lands of the state; created an *ex officio* board, known as " The President and Directors of the Literary Fund," to manage the fund; and decreed that the income should be applied " to the instruction of such children as it may hereafter be deemed expedient by the legislature to instruct in the common principles of reading, writing, and arithmetic." The principal of the fund was about $50,000 in the beginning. The income was added annually to the principal, and by 1836 it had reached $242,045. All but $300,000 of the Surplus Revenue (*q.v.*) received in 1837 was added to the fund; in 1838 the fund was reported as $1,732,485; and in 1840 as $2,241,480. In 1831 an act to raise a fund to establish free schools in Johnston county, and an act prohibiting the teaching of reading or writing to slaves were passed. In 1832 there was some agitation for the establishment of a monitorial system of education for the state. In 1835 the constitution of 1776 was revised, but with no change or addition to the clause relating to education. In 1837 the Literary board was changed to one consisting of the Governor and three appointed by him, and $208,000 were appropriated from the fund to drain the swamp lands of the state. It was not until 1839 that the first law providing for the organization of schools was passed.

In 1838 the directors of the Literary Fund made a detailed report to the legislature, and submitted a plan for the organization of public schools. In 1839 a law was finally passed, providing for the election of from five to ten persons in each county, by the county courts, to act as superintendents of common schools. They were to divide the counties into school districts, not over six miles square, and to appoint three to six school committeemen for each district. County courts were to levy a school tax of $20 per district, and the state was to grant $40 per district from the Literary Fund. A school census was also provided for. A referendum on the law was provided for, and it was not to go into effect in any county until adopted by the voters. In 1839–1840 sixty districts in four counties received grants, and these were the first payments from state funds made by the state.

These marked the beginnings of public common schools in North Carolina.

From 1840 to 1852 has been called the experimental period. In 1840 the law of the preceding year was revised and improved, The board of county superintendents was to elect one of their number as chairman, and this step marks the beginning of the county superintendency. The income of the Literary Fund was now to be apportioned to counties accepting the law, in proportion to the federal census, and then to the districts by the board of superintendents. The census of 1840 shows that there were then in the state two universities, 141 academies and grammar schools, 632 primary and common schools, and 19,483 pupils in attendence at the 775 schools of different kinds. By 1850 there were 2657 schools and institutions, and 104,095 pupils. In 1844 the system as established was somewhat crippled by an increase in the number of school districts, accompanied by a decrease in the taxes. By 1846 the laws of 1839 and 1840 had been finally adopted by all of the counties, though a number still did not levy a local tax. In 1849 the first edition of the school laws was printed and distributed. In the same year the legislature authorized the appointment of county superintendents. In 1852, after some years of effort, a law was secured providing for the appointment of a State Superintendent of Common Schools, to be chosen by the legislature, for two-year terms, at a salary of $1500. Up to this time the directors of the Literary Fund had exercised all the state supervision there had been. The first appointee, Dr. Calvin H. Wiley, occupied the position until legislated out of office in 1866, and to his efforts the reorganization and development of the system are largely due. The eleven annual reports made by him during his term reveal a constant increase in schools, attendance, and interest in public education. In 1855 the school law was revised and reënacted. By 1858 a four months' average term of school was maintained in the state, and by 1860 there were six colleges for males, thirteen for females, 350 academies and select schools, and 4000 primary schools in the state, with a total enrollment of 177,400. The school system of North Carolina was at this time, perhaps, the best of any of the slaveholding states, and compared favorably with some of the northern and western states.

The Civil War stopped this development. In 1861 the counties were given permission to omit taxes for schools during the War, although most of them did not do so. As late as 1863 fifty counties report 1076 schools as still in existence, and in 1864 an act to grade the common schools was passed. At the outbreak of the War, the Literary Fund amounted to over $2,000,000, and it is much to the credit of the state that the integrity of this fund was respected throughout. At the close of the War the bank stocks, in which more than one half of the fund was invested, were worthless, and the other assets were finally sold for a fraction of their former value. The proceeds were invested in North Carolina special tax bonds, but these were later repudiated by the state, and the remainder of the fund was lost. The only asset of value remaining was the swamp lands, and out of these the present fund has been almost entirely built up. In 1873 the fund was only $23,307; in 1910 it was $456,471, with some swamp lands still unsold. The loss of the school fund caused the schools to close in 1865, and they were not reopened again until 1870. The University of North Carolina continued open until 1868, was closed during 1868–1869, was opened again during 1869–1870, and then was closed until 1875.

A new state constitution was prepared in 1866, but rejected by the voters. Another was prepared in 1868 and adopted. This provided for a fully organized state school system for all children in the state. A State Superintendent of Public Instruction, elected by the people for four-year terms, superseded the Superintendent of Common Schools, and an *ex officio* State Board of Education superseded the old President and Directors of the Literary Fund. A state school fund was provided for, succeeding to the assets and income of the old Literary Fund. The district school system and a four months' school were ordered, and a compulsory education law sanctioned. Detailed constitutional provision was made for the University of North Carolina, and for the establishment, later, of an agricultural department. Some schools were opened, but they did not prosper. The state was impoverished, the insistence upon equality for the colored children was offensive, and the appointment of a negro as Deputy State Superintendent did not improve matters. In 1876 the people, having passed through the Reconstruction period, adopted another new constitution. The educational provisions of the constitution of 1868 were continued in the new constitution with but few changes. Equality of privilege, but separate schools for the two races, were made mandatory. The Superintendent of Public Works was dropped from the State Board of Education; the detailed provisions for the University of North Carolina were omitted; and the legislature was directed to establish a normal, as well as an agricultural department, at the university.

For some time schools and school expenses increased very slowly. After about 1880, the state began to recover somewhat from the devastation of the War, and educational conditions began to improve, though it was not until about 1900 that the expenditures for school purposes, schoolhouse valuations, attendance at school, and length of term began to increase at all rapidly. Since 1900 progress has been marked. The most serious drawback to educational development, aside from the comparative poverty of the state, has been the constitutional limit placed on local taxation. This was not removed until 1907. During these early years much valuable assistance was received from the Peabody Fund (*q.v.*), and some assistance is still received from this foundation and from the General Education Board (*q.v.*). In 1876 the first city school system was organized under a special act of the legislature, so as to permit of the levy of a local tax. By 1886 eight such acts had been passed; by 1896, sixteen; and by 1906 seventy-eight. Special taxing districts have also been formed by law in almost all of the counties. In 1876 the first two normal schools, one for each race, were established; and in 1881 two more for each race were created. The number for colored teachers finally rose to seven, but in 1903 these were consolidated into four. In 1881 a new consolidated school law was enacted; the state tax for education was increased to twelve and a half cents; and county superintendents of schools and county teachers' institutes were created. In 1885 County Boards of Education were also created, and in 1909 these were improved by having the terms of members lengthened from two to six years, one, instead of all, going out of office each biennium. In 1889 an Agricultural and Mechanical College for whites and in 1891 a similar institution for colored students were established. A state institution for the deaf and dumb was also created.

In 1899 the first state appropriation of $100,000, to aid in securing the four months' school required by the constitution, was made by the legislature; in 1901 this was doubled; and in 1909 further increased to $225,000, and its method of apportionment much improved. In 1901 the rural school library law was enacted, and in 1903 the law extending aid to established libraries was added. In 1903 the policy of using the State School Fund (Literary Fund) as a loan to the districts to build schoolhouses, at 4 per cent interest, one tenth repayable annually, was begun. The Appalachian Training School for white teachers was also established in this year. In 1907 the high school law with state aid of $45,000 annually (since increased) was enacted; high school courses were to be prescribed by the State Superintendents; high school teachers' certificates were first provided for; the first compulsory education (an optional law) and child labor laws were passed; the education of the deaf and dumb was made mandatory; the East Carolina Teachers' Training School was established; and subcommissions of teachers, to assist the State Textbook Commission in adopting textbooks, were provided for. In the same year the Supreme Court of the state reversed a former decision, and made possible a county tax for schools, even though the ordinary tax limit had been reached. In 1909 the legislature enacted a county school tax law, permitting a county tax for schools up to five cents, and fifteen cents on the poll, and the legislature of 1911 increased the limits six times. In 1909 teachers' institutes were made mandatory for each county, at least biennially; and in 1911 all teachers were required to attend a summer institute or a summer school at least once in two years. In 1909 county boards of education were authorized to order the enforcement of the compulsory education law at their discretion without waiting for local adoption. In 1911 the "County Farm-Life Schools" law was passed.

Present School System. — At the head of the present school system is an *ex officio* State Board of Education and a State Superintendent of Public Instruction. The State Board consists of the Governor, Lieutenant-Governor, Secretary of State, Treasurer, Auditor, Attorney-General, and the State Superintendent. They have corporate powers, the general government of the schools and the State School Fund, and succeed to all the powers and duties of the President and Directors of the Literary Fund. The Board is also *ex officio* a State Textbook Commission, has control of the colored normal schools, and selects trustees for white normal schools. It makes all loans from the permanent school fund to the county boards for building schoolhouses, as provided for by the law of 1903; may increase the statutory studies for elementary schools; and approves the establishment of high schools in counties. The State Superintendent of Public Instruction is elected by the people for four-year terms. He is *ex officio* a member of the State Board, and also acts as its executive officer. He publishes the school law; signs the orders for all state money paid out; has the general direction of the school system of the state and the enforcement of the school law, and all school officers are to obey his instructions and interpretations; he appoints institute conductors, and determines the time and place of holding the county institutes; prescribes the course of study for the high schools of the state, and inspects state-aided schools; makes rules and regulations; prepares lists of books for the rural school libraries; and approves all schoolhouse plans. He is required to know educational conditions in all parts of the state; to keep in touch with educational progress in other states; and to make a biennial report to the Governor. He acts as Secretary of the State Board of Education and of the State Textbook Commission; as a trustee of the State Library and of the Appalachian Training School; is President of the Board of Trustees (or Directors) of the State Normal and Industrial College, and of the Eastern Carolina Training School; is chairman of the State Board of Examiners;

has supervision and control of the normal department of the Cullowhee High School; and is a member of the Advisory Board on farm life education, which outlines the course of study for the County Farm Life Schools.

For each county there is a county board of education, and a county superintendent of schools. The county boards of three members are elected by the legislature, for six-year terms, one each biennium. Vacancies are filled by the State Board of Education. Members are paid $2 per day and mileage, and no teacher is eligible for appointment. The county boards have corporate powers as to acquiring, holding, and disposing of school property; have power to make rules and regulations for schools, teachers, pupils, and attendance; determine the time for opening and closing the schools; contract for and direct the building of all new schoolhouses, and may condemn land for the same; may pay one half the cost of the same from the building fund; control all loans from the state fund to the districts for building; estimate the annual county tax needed to maintain a four months' school; may create, abolish, and consolidate school districts, and provide transportation for pupils of either race; have power to enforce the school law in their county; may remove any teacher or school committeeman, for cause; on complaint of the State Superintendent, may remove the county superintendent, or one of its own members; approve the annual report of the county superintendent; publish an itemized account of receipts and expenditures; appoint all school committeemen, except in cities under special charter; appoint a custodian for the district libraries, and control their establishment and aid; may establish and maintain county high schools, with the consent of the State Board of Education; may arrange for free tuition of pupils in existing high schools; have control of the enforcement of the compulsory education law; apportion the county school funds; and may call elections for the establishment of County Farm Life Schools, or for the voting of a county school tax. They elect the County superintendent of schools, who acts as their secretary and executive officer. He is elected for two-year terms, and need not be a resident of the county when elected. He must be "a practical teacher, and have had two years' experience." He must devote his entire time to the work, and his salary is determined by the county board. He must attend the annual state meeting of county superintendents and the district superintendents' association. He advises with the school committees; exercises a general supervision over the schools; examines teachers for county teachers' certificates; is *ex officio* a member of the Board of Trustees for the County Farm Life School, and supervises the work of the school; and makes an annual report to the State Superintendent.

In some counties the township system of control prevails, and in others the district system. For each township or school district in the county the county board of education appoints three persons, for two-year terms, to act as a school committee. They are to care for the property of the township or district, and have immediate control over the same; they take a biennial school census; purchase school supplies, up to $25 a year, on the order of the county board; they employ all teachers for the schools for a maximum term of two years; and they may contract with a private school in their township or district (if not sectarian or denominational) for the education of the public school pupils. Such a school then becomes a public school. The county treasurer is treasurer of each township or district, and pays out funds on orders from the school committee.

Cities and towns operate under special charters, have their own superintendents, and are not under the control of the county boards of education, except in a general way, although most general school laws apply to such special districts as well. Town and city school committees consist of five to seven members, and are appointed by the boards of aldermen. The town or city constitutes one school district, and the school committee provides such schools for each race as seem equitable and just. Any union of two or more districts, a town, or a city may employ a superintendent of schools, if the county board of education consents. Textbooks, uniform for the state, are adopted by the State Textbook Commission.

School Support. — Until recently the schools have been greatly retarded by lack of sufficient funds. State aid was not granted until 1899, and as yet is small. In 1907 a favorable Supreme Court decision opened the way for the first time for adequate county school taxation. An annual state appropriation of $125,000 is distributed to the counties on the basis of school census. A further state appropriation of $100,000, less $7,500 for aiding rural school libraries, is apportioned to the counties levying a county school tax, and in such a manner as to duplicate sums raised locally, secure a four months' school, and equalize terms. Under the new law of 1909 it is the duty of the county board of education to estimate the amount of money needed each year to maintain a four months' school uniformly throughout the county, and it is the duty of the county authorities to levy the amount estimated, up to a tax of five cents on the $100 and a poll tax of fifteen cents. Under the 1911 law they may also request a general county election to vote an annual county tax in any amount up to thirty cents and ninety cents poll. All proceeds of estrays, fines, forfeitures, liquor and auctioneer licenses, and three fourths of the general poll tax of $2 also go to the county school fund. In apportioning this fund to the districts, the county board may set aside from 7½ per cent to 20 per cent as a Building Fund, and the remainder must be so apportioned to the different townships and districts as to enable all to provide an equal length of term. While the census basis is to be used as a first approximation, it may be ignored entirely if necessary to equalize educational advantages throughout the county. Cities and towns may vote a local school tax up to thirty cents, and ninety cents poll. Special tax districts may also be formed by the county boards of education, without reference to township lines, for the levying of a similar tax. In 1900 there were but 30 such special tax districts; in 1904, 228; and in 1910, 995. In addition any township may vote a special township tax of from ten to thirty cents and from thirty to ninety cents poll for a township high school. In all cases a petition is presented and an election called. If the proposition is carried, then the tax becomes an annual tax, the school committee of the district determining the amount each year, up to the maximum limit voted.

Educational Conditions. — Ten years ago North Carolina was one of the most backward states educationally in the Union, but the last decade has witnessed a wonderful change and improvement. The great increase in local taxation, as well as the beginnng of state grants for elementary schools, high schools, and libraries, are marked features of the recent development. Expenditures for education have trebled in ten years, while the school population has increased but 5 per cent. The average term has been increased from 77 to 102 days in the same period, school property greatly improved, about 2500 rural school libraries have been created, high schools developed in nearly every county, some marked progress has been made in the consolidation of rural schools, and a strong sentiment awakened in favor of better education in the state. A State Inspector of Rural Schools has been provided by the Peabody Fund (*q.v.*); the state has provided a supervisor of institutes, reading circles, and normal training; and a state supervisor of agricultural instruction and extension work has been provided by the General Education Board (*q.v.*). Instruction in domestic science is provided for in the colored normal schools from the Slater Fund (*q.v.*). The State Board of Health has coöperated in giving instruction in hygiene and public health. The Committee for the Promotion of Public Education in North Carolina, aided by the Southern Education Board, has carried on a vigorous educational campaign in the state. Aided by the Peabody Fund, the Woman's Association for the Betterment of Public School Houses and Grounds has kept a traveling representative in the field.

One third of the total population is of the negro race, and in a few counties these outnumber the whites. The negroes own very little property, yet the state attempts to provide equality of term and opportunity for the children of the two races. The state maintains schools for Indian children in three counties, although there are but about 1000 of these, and also an Indian Normal School. The state has no foreign population to contend with, less than ½ of 1 per cent being foreign born. In illiteracy the state has in the past ranked rather high, but a determined effort has been made to stamp this out by providing equal educational advantages for all, and by compulsory education. The state is essentially rural and agricultural. About 85 per cent of the total population live in country districts, there are no large cities in the state, and manufacturing has not as yet developed to any large extent.

Secondary Education. — A strong effort to develop high schools has been made within recent years. The high school law of 1907, the requirement of high school teachers' certification, and the inspection and approval of the course of instruction by the State Superintendent have done much good. The first year .after the passage of this law 156 high schools were established, and by 1910 the number had reached 170. In addition, one white school in five and one colored school in twenty-five are reported as offering some high school instruction. Any county board of education may establish one or more high schools in a county, and appoint a high school committee of three to manage each school, or may arrange for free tuition of pupils in existing town schools. All such schools must have at least three teachers, one of whom must be engaged wholly in high school work. Many of these schools are in part grammar schools, offering only the first two years of high school instruction. Schools, outside of towns of 1200 or more inhabitants, may receive state aid under rules and regulations adopted by the State Board of Education, and any school may be aided for tuition pupils received, the state paying one half of the expense up to $500 per school. All high schools must provide a five-months' term. Secondary education for the colored race is provided in the state normal schools, the State Normal and Industrial School at Burgah, the State Agricultural and Mechanical College at Greensboro; and in some twenty other institutions of secondary rank, mostly denominational in control, a number of which are industrial in type.

The new County Farm Life Schools (1911) are also an interesting secondary school development. One is to be established eventually in each county, at the rate of ten a year, and each is to receive $2500 aid annually. Each school must have twenty-five acres, dormitory, barn, dairy, and school building; offer instruction in practical farm life and homemaking to both sexes; and short courses and extension courses to farmers and their wives. An ordinary high school department is also to be maintained, and all teachers must hold high school certificates. Counties are to vote to establish such schools, and issue bonds to equip them. To govern these schools, the county board of education is to appoint one person from each township in the county to act as a board of trustees, with the county superintendent as an *ex officio* member.

Teachers and Training. — Of the 11,216 teachers employed in 1910, one fourth were in schools for the colored race. Of the white teachers 31 per cent had had normal training, and 20 per cent held college diplomas, while of the colored teachers 46 per cent had had normal training, and 15 per cent held college diplomas. For the training of future teachers the state maintains three normal schools for white students, one for Indian students, and three for colored students. All teachers' certificates must be obtained on examination, as the law distinctly provides that no diploma of any college or normal school shall give the holder the right to teach in the state without submitting to an examination.

Higher and Special Institutions. — The University of North Carolina at Chapel Hill, founded in 1789; the North Carolina College of Agriculture and Mechanical Arts for white students at West Raleigh, founded in 1889; and the Agricultural and Mechanical College for the Colored Race at Greensboro, founded in 1894, stand as the culmination of the public school system of the state. In addition to the above, eight collegiate institutions for women, four for men, and seven for both sexes, nine of which were founded before the Civil War, also assist in the work of higher education in the state. Some half dozen additional institutions, mostly denominational, offer collegiate instruction for the colored race, the most important of which is Shaw University (*q.v.*) at Raleigh. E. P. C.

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NORTH CAROLINA, UNIVERSITY OF, CHAPEL HILL, N.C. — The oldest of the state universities, in the actual teaching sense, chartered in 1789. The first session began in 1795. Around the University sprang up the town of Chapel Hill. The first president of the University was Joseph Caldwell, a graduate of Princeton, and in the beginning it was patterned after that institution. While established and controlled by the state, no direct appropriation was made either for buildings, equipment, or support during the first ninety years of its existence. It was dependent upon donations, certain escheated property, and the fees of the students. Still it flourished and was progressive and vigorous under President Caldwell. The first state geological survey was organized in 1823 by members of its faculty, and the first college observatory was built there in 1827.

On the death of Caldwell in 1835 David L. Swain became president. Under him various buildings were added and an endowment of several hundred thousand dollars accumulated. The University expanded until by the opening of the Civil War it was attended by 430 students, about half of whom came from outside the state, representing every Southern state. During this first half century of service it had furnished one president of the United States and one vice president, many senators, representatives, members of the cabinet, and other national officials, besides some 60 per cent of all the leading officials, civil and judicial, in its own state.

The sacrifice and the loss of this institution in the Civil War is perhaps unparalleled. Fourteen members of the faculty volunteered; seven gave up their lives. About 45 per cent of the living alumni entered the service, and nearly 30 per cent of these were killed or died in the service. More than twenty generals were furnished to the Confederate armies and one to the Union. About half of the regiments furnished by North Carolina were commanded by the University's alumni. The close of the war saw the University practically beggared. Under order of the court all of its property except the immediate buildings and such woodland as was necessary for furnishing fuel was sold to meet its bonded and other indebtedness. In 1869 President Swain died. The University dragged through two or three years of the Reconstruction Period as a sort of high school and was then abandoned, losing most of such apparatus as was left, its buildings lying open and uncared for. Only its books and collection of portraits were preserved.

Reopened in 1875, friends and alumni contributed for its repair. The state paid for its support the interest on the Land Scrip Fund amounting to $7500, the state treasury having been looted of the original fund. This payment was discontinued in 1887 when the Agricultural and Mechanical College was established at Raleigh. In 1876 Kemp P. Battle was elected president and continued in office until 1891, the University thus almost rounding out its first century under three presidents.

The struggle with poverty and against strong denominational antagonism was severe; the rebuilding was slow and arduous. All hope of regaining the large patronage from other Southern states was gone. In 1881 the state began to make appropriations for maintenance and a little later for repairs and ordinary equipment, but the first appropriation for a building was made in 1905 — just 110 years after the opening of the University. It has a campus of fifty acres, some twenty odd buildings, a library of 65,000 volumes, and all together property approaching $1,500,000 in value. Its total income amounts to $175,000.

The University has grown into an institution with a faculty numbering nearly 100 and more than 800 students. It comprises a college of liberal arts and a college of applied science and well-developed schools of graduate studies, law, medicine, and pharmacy. The entrance requirements are fourteen units. F. P. V.

NORTH CENTRAL ASSOCIATION OF COLLEGES AND SECONDARY SCHOOLS. — See EXAMINATION AND CERTIFICATION BOARDS.

NORTH DAKOTA, STATE OF. — Organized as a Territory by Congress in 1861, and at that time embracing 350,000 square miles. In 1864 Montana Territory, and in 1868 Wyoming territory were set off, and in 1889 the Territory was further divided, and admitted as two states of almost equal size, — North Dakota as the thirty-ninth state, and South Dakota as the fortieth. North Dakota is located in the western part of the North Central Division of states, and has a land area of 70,183 square miles. It is about the same size as the six New England states and New Jersey combined. For administrative purposes the state is divided into forty-six counties, and these in turn into townships, though five of the older counties still retain in part the district form of school organization. In 1910 North Dakota had a total population of 577,056, and a density of population of 8.2 persons per square mile.

Educational History. — At the first Legislative Assembly in 1862 " An Act for the Regulation and Support of Common Schools " was passed. This provided for the appointment of county superintendents, the division of counties into school districts, the election of boards of three trustees for each district, an annual district tax, a three months' term of school in each district, the examination and certification of teachers, and for graded and union schools. It is doubtful whether many school officers were appointed or any schools were opened under this law. The Territory had but few people, and the Indian massacres and war of 1862 left Yankton (S. Dak.) the only settlement. In 1864 an *ex officio* Territorial Board of Education was created, which was to appoint a Territorial Superintendent of Public Instruction. In the first report of this Board in 1864, no public schools (though a few private schools) are mentioned in the Territory, and but few counties had appointed county superintendents. In 1865 there were but four legally organized school districts in the Territory, and a few private schools, with a total combined school enrollment of 382 pupils, and a school census of 621. In 1866 the *ex officio* Territorial Board was replaced by one of three specified persons, who, however, failed to qualify. In 1868, and again in 1869 and 1871, the school law was revised and reenacted, though without substantial changes. In 1867 the office of Territorial Superintendent was made elective, and for two-year terms, and a county school tax of two mills and $1 poll were added to the previously authorized district taxation. In 1867 teachers' institutes of from four to ten day's duration were authorized; in 1873 optional county teachers' institutes were permitted; and in 1875 the territorial teachers' institutes were restored. In 1871 a Deputy Territorial Superintendent for the northern part of the territory was provided for by the new law. In 1873 the 100 schools reporting had an attendance of 2006 children, out of a total school population of 5312 in the Territory. In 1875 the school law was again revised, the old provisions for union graded schools dropped out, and a list of textbooks adopted for the schools by name and by general law. In 1877 the Territorial Superintendent was changed from elective to appointment by the Governor and Council, as had originally been the case.

Up to about 1879 the growth in population in the territory had been slow, but during the next five years the school population almost trebled, and educational development was correspondingly rapid. After 1880 the idea of separate statehood for the two parts of the Territory seems to have taken root, and school statistics are reported separately after 1883, for North and for South Dakota. In 1879 women were permitted to vote at school elections, and in 1881 they were made eligible for the office of county superintendent. Bonds for schoolhouses up to $1500 were first authorized in 1881. In 1881, also, two Territorial Normal Schools were created; in 1882 the University of Dakota at Vermilion (now the University of South Dakota), whose charter dated back to 1862, was opened for instruction; in 1883 the University of North Dakota at Grand Forks, and the Territorial Agricultural College at Brookings (now the S. Dakota College of Agric. and Mech. Arts), were chartered. In 1885 a State School of Mines was established at Rapid City, and this is now the South Dakota School of Mines.

The school law was completely revised again in 1883, and made into almost a new law. School districts were abolished, and the township form of school organization substituted in all except eighteen of the older counties, and in these exceptions the Boards of County Commissioners were authorized to put the law in force, if they saw fit. Three of the eighteen counties adopted the township form, so that in 1884 there were sixty-five counties under the township form of organization, and fifteen under the district. The act also increased the salaries of county superintendents from $600 to $1500; made the beginning of the appropriations for holding institutes by making an annual grant of $600; provided for county institute funds, to be derived from fees for examinations for teachers' certificates; and provided for the compulsory education of all children, ten to fourteen years of age, for at least twelve weeks each year. Another new school law was enacted in 1887. A Territorial Board of Education of three members was created and given important supervisory authority; normal teachers' institutes were provided for, with state-appointed institute conductors; a state course of study was to be outlined by the Territorial Board of Education; and the Territorial Superintendent was authorized to designate private institutions and to grant aid to them for the training of teachers for the territory.

In 1889 Congress passed an Enabling Act for the formation of a constitution and for the admission of Dakota Territory as two states. (For the subsequent educational history of South Dakota, see special article on that state.) North Dakota framed and adopted a state constitution, and was admitted as a state in the same year. At the time of the admission as a state, the North Dakota public school system consisted of 35 graded and 1366 ungraded schools, with high schools in the cities and in some of the villages. There were also a state university and one state normal school in operation.

The Enabling Act made large grants of land to the new state for various educational purposes, and demanded that the state should guarantee the safety of the grants, and provide for the establishment and maintenance of a system of public schools, open to all children, and free from denominational or sectarian control. The new state constitution guaranteed the safety and proper application of all grants made, and made mandatory the establishment of a system of free public schools, "extending through all grades up to and including the normal and collegiate courses." The state university at Grand Forks and the normal school at Valley City were perpetuated as state institutions, and the following new state educational institutions were created and located by constitutional provision: a state school of mines, to be located in connection with the state university at Grand Forks; an agricultural college at Fargo; a second state normal school at Mayville; a school of forestry, in one of four specified counties; a state scientific school at Wahpeton; an industrial school and school for manual training at Ellendale; a reform school at Mandan; a school for the deaf and dumb at Devil's Lake; an asylum for the blind in Pembina county; and a department for the training of the feeble-minded, in connection with the state insane asylum. The constitution further provided that "no other state institutions of a character similar to any one of those created by this article shall be established or maintained without a revision of this constitution." All lands granted (See NATIONAL GOVERNMENT AND EDUCATION) were carefully safeguarded as to sale and sale price; the different funds were declared inviolate, detailed provisions were made for the safeguarding of the lands and funds, and the legislature was forbidden to divert any fund, even temporarily; the interest on the permanent school fund was made distributable on school census alone; a State Board of University and School Lands Commissioners, consisting of the State Superintendent of Public Instruction, the Attorney-General, the Secretary of State, and the State Auditor, was created to control the appraisement, sale, and rental of the school lands, and the investment of the proceeds; a State Superintendent of Public Instruction, and County Superintendents of Schools, to be elected by the people, for two-year terms, were made constitutional officers; women were made eligible to vote for any school officer and to hold any school office; sectarian aid was prohibited; and legislation relating to the prevention of illiteracy and the "securing of a reasonable degree of uniformity in course of study, and to promote industrial, scientific, and agricultural improvement," was permitted. The constitution, in its educational provisions, is one of the most elaborate, specific, and mandatory of any framed by the states.

The state legislature of 1890 put the constitutional provisions into operation by the enactment of a new school law, which outlined a good state system of education. A State Board of Education not having been provided for in the constitution, the State Superintendent succeeded to the powers and duties possessed by the old board. He was also charged with the preparation of all examination questions for teachers' certificates in the state, state professional certificates were provided for, and the organization and management of the State Teachers' Reading Circle was placed under his direction. The new law, dealing with the question of the school unit and compelled to provide for a uniform system, created the district as the unit, but provided that district lines should conform to township lines wherever possible. This permitted conditions to remain as they were, thirty-three counties in the new state using the township as the district, and five counties having the school district form of organization. In 1911 new legislation permitted the rearrangement of district lines in these five counties, with a view to a partial abolition of the district unit.

The first few years of statehood were a trying period, and little new legislation was enacted, although steady educational progress was made. In 1895 a health and decency law, a law permitting any city, town, or school district to provide free textbooks, and a law creating a State High School Board, consisting of the Governor, Superintendent of Public Instruction, and the President of the University, to inspect and classify the high schools, were enacted. Within two years one third of the schools of the state had voted to provide free textbooks and supplies. A state high school course of study was issued in 1895, and a state elementary course in 1897. In 1898 the State Superintendent began to send out traveling school libraries, and in 1899 the plan was established and provided for by law. In 1907 a State Public Library Commission was provided for. In 1905 the teachers' examination law was revised, third-grade county certificates were abolished, and a minimum teachers' wage law was enacted. In 1907 counties were permitted to organize a three to four weeks' summer teachers' training school, in place of the required county teachers' institute, and by 1900 twenty-four counties had adopted this plan. State aid to accredited high schools was first voted in 1899; the state two-mill tax was changed to a two-mill county tax; the consolidation of schools was authorized; the provision of free textbooks and supplies, on a two thirds petition, was made mandatory on school corporations; and increased aid was extended to the county teachers' training schools. A State School Law Commission was created in 1909 to revise and recodify the school laws of the state, and a revised school code, detailed below, was enacted by the legislature of 1911. The legislature of 1911 also enacted a number of important new school laws. The State High School Board was reconstructed, and a State Agricultural and Training School Board was created. Appropriations were made for a State Inspector of Rural and Graded Schools, and a State High School Inspector. State graded and state rural schools, of two classes each, and state consolidated schools, were defined; the requirements and course of instruction for state approval named; and definite state grants to each provided for on inspection and approval. The grants to the regular high schools were increased, and their inspection and approval also provided for. The introduction of agriculture, manual training, and domestic science into the regular high school courses, and the affiliation of rural schools with such a central high school, were also provided for, and state aid for them voted. A State Educational Commission was also created, to report in 1912.

Present School System. — At the head of the present school system of the state is a State Superintendent of Public Instruction, elected by the people. The election is for two-year terms; women are eligible for the office, and the person elected must hold the highest grade of state professional certificate. He appoints his deputies, who must possess similar qualifications, and his clerks and office force. The work which in a number of states is performed either by a State Superintendent or a State Board of Education, or by the two working together, is here split up among the State Boards of Land Commissioners, Library Board, Board of Examiners, High School Board, Normal School Board, Agricultural and Training School Board, and the State Superintendent. Each of these boards has special parts of the school system to supervise. The State Superintendent is *ex officio* a member of each of these Boards. To the State Superintendent is given the general supervision of the school system of the state. He advises with the county superintendents, decides disputed questions under the school law, holds conferences with school officers, prepares and furnishes all blanks and forms; apportions the State Tuition Fund to the counties, edits the school laws, and makes a detailed biennial report to the Governor. He also issues plans for one- and two-room schoolhouses, approves all schoolhouse plans, prepares and prescribes the course of study for the common schools of the state, and prescribes rules and regulations for teachers' institutes, outlines the course of instruction for them, and appoints all institute conductors. He appoints a State Inspector of Rural and Graded Schools to act for him in their examination and approval, and the State High School Board appoints another deputy to act as a State Inspector of High Schools.

For each county a county superintendent of schools is elected by the people for two-year terms. He, or she, must be a college or normal school graduate, or hold a state professional certificate, and must have had at least two years' experience as a teacher. There are no county boards of education in the state. The county superintendent has general supervision of the schools of his county, and must visit each school at least once each year, and advise with teachers and school officers. Once each year he holds a convention of school officers; may hold monthly meetings with his teachers; and holds an annual teachers' institute, or a teachers' training institute of three to four weeks' duration. He keeps a corrected map of the school districts of his county; apportions state and county funds to the districts; appoints school directors to fill vacancies; decides school controversies, though appeal to the State Superintendent is allowed; and makes an annual report to the State Superintendent. With the County Superintendent of Health he inspects schoolhouses, may order needed sanitary changes, and approves minor alterations. He also acts as an agent of the State Board of Examiners in the conduct of examinations for teachers' certificates; approves petitions for organizing state graded schools, rural schools, and township high schools; and acts, *ex officio*, as a member of the board of trustees, if a county agricultural and training school is established in his county.

The school unit below the county is the township, although in five counties the district system is still used extensively. The 1911 legislation was intended to make these counties in part conform to the plan followed elsewhere in the state. There are in the state, then, school districts, in the ordinary sense of the term, township districts, and certain segregated districts (towns or cities) known as city districts, special districts, or independent districts. These latter segregated city and town districts are under boards of education. For all other school districts a board of three school directors is elected, one each year, for three-year terms. The people of each district also elect a treasurer, for two-year terms, and the board appoints a clerk, not one of their number, who holds office at the pleasure of the board. There must be four regular meetings of each board each year, and in the cities twelve meetings. Each board of school directors has general charge and management of the schools under their charge, the care of the school property, the making of repairs, and the supplying of necessary equipment. They employ all teachers for the schools; may admit non-resident pupils; may add branches of instruction, with the approval of the county superintendent; may call an election to vote money for buildings or to buy sites, up to five acres in extent; and may levy district school taxes up to thirty mills. They must make such repairs and alterations in buildings as are ordered by the county board for sanitary inspection (Co. Supt. of Schools, and Co. Health Supt.), and can only purchase such books for the school library as have been approved by the State Superintendent. They must organize schools within the district (township) wherever there are nine children without school facilities. They determine the time and length of the school term, which must be equal for all schools in the district, and not less than seven months in any school. They may, and on petition of one third of the residents must, call an election to vote on the question of consolidating the schools, and they may provide stables at the consolidating center. If the district contains sixty children of school age, the board may, and on petition of ten residents must, call an election to decide the question of providing high school facilities for the district. An annual school census must be taken by the clerk, and he must also make a detailed annual report to the county superintendent. Each board must see that all records, reports, and instruction are in the English language.

Cities and incorporated towns may organize as independent districts, and segregate themselves from the township district. A board of education of five is then elected, in place of the three school directors. City districts, formerly organized under special laws, may reorganize as independent school districts, under boards of education with a membership based largely on ward representation. For all such districts the general school laws apply, and the boards of education have the same powers and duties as boards of school directors. In addition, they may establish graded schools, high schools, and such other schools as may be desired; must maintain a term of from seven to ten months; may purchase, sell, and repair schoolhouses; may employ a district school superintendent; and may levy local school taxes, up to thirty mills.

School Support. — On the admission of the state in 1889, the state received the sixteenth and the thirty-sixth sections in each township for schools, a few Indian reservations excepted, and has since been granted the sections in some of these. The total grant to the permanent school fund of the state was approximately two and a half millions of acres, on which a minimum sale price of $10 an acre was placed. About two fifths of this has since been sold, and at an average price of about $15 an acre, while recent sales have been for much larger figures. The 5 per cent of land sales grant was also given to the permanent school fund, and this, up to 1910, had produced $433,905. In all a total permanent school fund of about $16,000,000 has so far been produced. The land remaining is conservatively estimated as worth $18,000,000 more, and will probably bring $25,000,000. In all a fund of $40,000,000 for common schools seems probable from the proceeds of the enabling act grants for common schools alone. In addition, 500,000 acres, to be selected by the state, were granted for the higher, reformatory, charitable, and public institutions in the state, as follows: state university, 40,000 acres; school of mines, 40,000 acres; agricultural college, 40,000 acres; state normal schools, 80,000 acres; reform school, 40,000 acres; deaf and dumb asylum, 40,000 acres; public buildings, 50,000 acres; and for other educational or charitable purposes, 170,000 acres. The minimum sale price on all of these lands was placed at $10 an acre, and they should bring two or three times this amount. The income from each grant is to be used for the support of the institution for which it was granted.

The income from the permanent state school fund, together with all state fines, is apportioned quarterly to the counties, and by the counties to the districts, on the sole basis of the school census, six to twenty-one years of age. In addition, each county must levy a two-mill county school and a county poll tax, the proceeds of which are distributed to the districts on the same basis. Counties establishing a county agricultural and training school may levy, as needed, for its maintenance. In addition, any school district or school corporation may levy a district tax in any amount up to thirty mills, for further maintenance and equipment. Moreover, the state makes special appropriations for aid to high schools; to state graded and state rural schools; and for instruction in agriculture, domestic economy, and manual training in regular high schools; levies a state tax of one fifth of a mill for county agricultural and training schools; and a state tax of one mill, to be divided among the different state higher institutions.

Educational Conditions. — The state is essentially a rural and an agricultural state, 89 per cent of the people living in rural districts. There are no cities as large as 15,000 population in the state. The population is almost entirely white. There are a few Chinese and Indians, but practically no negroes in the state. About one third of the total population is foreign born, Norwegians, English-Canadians, Russians, Germans, and Swedes, in the order named, being the predominant foreign peoples and constituting about 75 per cent of the foreign born. These have settled in the rural districts and taken up farming. The large educational funds, the liberal taxation, and the large per capita wealth of the people make the maintenance of a good system of education easier than is the case in many other states, and good laws tend to secure these results. Good schools are maintained generally throughout the state, and the sentiment of the people is strongly in favor of good schools. Expenditures for education have multiplied four times in the past eleven years, though the school population has only doubled. School libraries are found in all districts, and $25 per year may be spent from the public funds for books. Free textbooks are furnished in about two thirds of the schools of the state. Any school commission or board may employ a medical inspector, and require the examination of its school children. The teaching of agriculture, domestic science, and manual training has recently been taken up with much enthusiasm, and the teaching of agriculture in central schools, to which rural schools may be affiliated, has recently been provided for. Standards for state graded and state rural schools have been formulated, and a state inspector of rural and graded schools appointed. The state has a good child labor law, and a reasonably satisfactory compulsory education law.

Secondary Education. — High Schools are being developed very rapidly in the state, especially within the past five years. By 1911 the number of approved high schools in the state had reached ninety-five, and the total number was much larger. A State High School Board, consisting of the State Superintendent, the Presidents of the State University and of the Agricultural College, two city superintendents of schools, and one citizen, the last three appointed by the Governor, exercise the functions of a State Board of Education for high schools. They appoint a State High School Inspector, who acts as their executive officer, and approves high schools for state aid. Courses of two, three, and four years may be approved. A State Agricultural and Training School Board, consisting of the State Superintendent, President of the Agricultural College, and three practical farmers appointed by the Governor, act as a State Board of Control for, and determine the qualifications of teachers and principals in, the new county agricultural and training schools authorized by the law of 1911. These schools must be provided with a good equipment, and must offer agricultural instruction correlating with that given in the Agricultural College. State aid, up to one half, and a maximum of $3000 a year, will be granted to such schools. State aid was also provided, to begin in 1912, for regular high schools which add instruction in agriculture, manual training, and domestic science The State School of Science at Wahpeton; the State School of Forestry at Bottineau; and the State Industrial and Manual Training School at Ellendale are state schools of secondary grade. The encouragement given to communities to form graded schools, and to gradually develop these into two-year high schools; the provision for the gradual evolution of these into three- and four-year high schools; and the strong emphasis placed on instruction in agriculture and domestic economy are strong points in the North Dakota plan for secondary instruction.

Teachers and Training. — A State Board of Examiners, consisting of the State Superintendent as secretary, and four teachers or superintendents appointed by the Governor as additional members, prepares all questions for the examination of teachers, oversees the grading of the answer papers, and grants all teachers' certificates in the state, with the one exception of teachers and principals in the county agricultural and training schools. This board also serves, *ex officio*, as a State Teachers' Reading Circle Board, and controls both the teachers' and the pupils' reading circles for the state. These have both been in existence for a number of years, and have rendered valuable service. Four grades of teachers' certificates are issued, and form a graded series, each requiring increasing knowledge and experience and having increasing validity; the highest is issued only to college graduates. Special certificates may also be issued in special subjects. Graduates of the University of North Dakota, of the Dakota State Normal Schools, and of other colleges and normal schools within the state offering equivalent instruction may be certificated without examination and on similar terms. For the training of future teachers the state maintains two State Normal Schools at Mayville and Valley City, and graduates of high schools which offer a four-year course, with certain review and professional subjects in the last year, may also receive a teachers' certificate on graduation. A State Normal School Board looks after the normal schools of the state. So far as it applies, work in summer sessions may also be accepted in lieu of examination subjects.

County superintendents may, if they desire, hold teachers' meetings one Saturday each month, which teachers outside of cities and high schools must attend. Superintendents may also hold an annual teachers' institute, or instead may organize a county teachers' training school, of from three to four weeks' duration. State aid of $100 a year is given each county for teachers' institutes, and, if a county training school is organized, the county must appropriate a sum equal to twice the number of teachers who have taught for four months in the county the preceding year. A portion of all teachers' examination fees also goes to the teachers' institute fund. Teachers are paid for one week for attendance. A state minimum wage law requires a minimum wage of $35 a month. The average wage for 1910 was $51.80.

Higher and Special Institutions. — The University of North Dakota and the State School of Mines at Grand Forks, and the State Agricultural College at Fargo, stand as the culmination of the public school system of the state. Fargo College (Cong.) at Fargo; Wesley College (M.E.) at Grand Forks; Grand Forks College (Luth.) at Grand Forks; and the Presbyterian College at Jamestown assist in the work of collegiate education in the state.

In addition to the above institutions, the state also maintains the State School for the Deaf and Dumb at Devils Lake; the state secondary schools, mentioned above; and the State School for the Blind at Bathgate.

E. P. C.

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NORTH DAKOTA, UNIVERSITY OF, GRAND FORKS, N.D. — Established by act of the Territorial Assembly Feb. 23, 1883, and opened its doors in September, 1884. In 1911 there were thirteen buildings, representing in their construction and equipment an expenditure of $700,000. The student body numbers 972; of these 495 are in the colleges, 348 in the summer session, and 129 in the Model High School. The teaching staff consists of 105 members, thirty-seven of whom are of professorial grade. The university maintains six colleges: Liberal Arts, Teachers, Mining Engineering, Mechanical and Electrical Engineering, Law, and Medicine; a mining substation at Hebron, N.D., and a biological station at Devils Lake, N.D. The State Public Health Laboratory and Geological Survey are under the authority of the Board of Trustees. The general and departmental libraries contain 45,000 volumes.

The university at the time of its establishment received 126,000 acres of land which, when finally sold, will give an endowment of $2,000,000. The assets of the university in 1911 amount to $2,400,000; the annual income is made up of payments from contracts and interest on land sales, the proceeds of the $\frac{33}{100}$ mill tax, special appropriations for maintenance, and payments of fees and rents. The income in the year 1911–1912 was $373,000, of which $32,600 was for buildings, and $41,000 for operation of the University Commons, leaving for the conduct of the university and its stations $229,400.

The principle of affiliation of church colleges with the state university was first inaugurated at the University of North Dakota in 1904, resulting in the maintenance of Wesley College, a Methodist school in affiliation with the university.

The university has had the following presidents: Dr. William M. Blackburn, 1884; Professor Henry Montgomery, acting president, 1885–1887; Dr. Homer B. Sprague, 1887–1891; Dr. Webster Merrifield, 1891–1909; Dr. Frank L. McVey, 1909–. F. L. M.

NORTHEND, CHARLES (1814–1895). — Educational writer; was educated at Dummer Academy and Amherst College. He was principal of the first grammar school at Danvers, Mass. (1836), and was afterwards superintendent of schools at Danvers and at New Britain, Conn. He was for many years secretary of the American Institute of Instruction, and was active in other educational associations. His publications, include: *Teacher and Parent* and *The Teachers' Assistant*. These books passed through many editions, and for more than thirty years they ranked as the most popular educational books. He was also the author of *Letters to Parents*, *Exercises in Dictation*, and numerous articles in educational journals. W. S. M.

NORTHFIELD SCHOOLS. — These include Northfield Seminary for young ladies, at East Northfield, Mass., founded in 1879, and Mount Hermon Boys' School, four and one half miles distant, founded in 1881. Both schools are of secondary grade and prepare for college. They were established by the late D. L. Moody, to meet the needs of young men and young women of limited means who were ambitious to acquire the benefits of a thorough Christian education. In addition to this characteristic, two additional features are prominent: (1) The Bible is emphasized in every course of study, and each student is required to take a minimum of two recitations a week in this subject, under systematic instruction. (2) Each student is required to discharge some assigned duty each day in the dormitories, in dining hall and kitchen, or farm. The grounds and buildings of the seminary represent an investment of $910,174, and the school has an endowment of $575,188. Mount Hermon Boys' School has invested in grounds and equipment $1,007,767, with a further endowment of $627,823.

NORTHRUP, BIRDSEY GRANT (1817-1898). — State Superintendent of Schools; was graduated from Yale College in 1841 and from the Yale Theological School in 1845. He taught in the public schools of Connecticut; was agent of the State Board of Education of Massachusetts (1857-1867), agent of the State Board of Education of Connecticut (1867-1873), and Secretary of the State Board of Education (State Superintendent of Schools) of Connecticut (1873-1883). His publications include: *Education Abroad*, *Forestry in Europe*, and *Lessons from European Schools*, and numerous reports on education. W. S. M.

NORTHWEST TERRITORIES, EDUCATION IN. — See CANADA, EDUCATION IN.

NORTHWESTERN COLLEGE, FERGUS FALLS, MINN. — A Lutheran denominational institution founded in 1900. The college grounds include eight acres located about half a mile from the center of the city of Fergus Falls. The institution comprises the following six departments: collegiate, normal, preparatory, commerce, music, art. The course of religious instruction is obligatory upon every regular student. There are (1912) nine instructors. The student body numbers 119. E. J.

NORTHWESTERN COLLEGE, NAPERVILLE, ILL. — A coeducational institution established at Plainfield in 1862 by the Evangelical Conferences of Illinois, Iowa, Indiana, and Wisconsin as the Plainfield College, the present name being adopted in 1864. The college was moved to Naperville in 1870. The following departments are maintained: academy, college of liberal arts, German, commerce, music, art, physical culture. The entrance requirements to the college are fifteen units of high school work. The degrees of A.B., B.S., and B.L. are conferred. The faculty consists of twenty-five members, and the student enrollment in 1911-1912 was 396.

NORTHWESTERN COLLEGE, WATERTOWN, WIS. — An institution founded in 1865 by the Evangelical Lutheran Synod of Wisconsin and comprising preparatory, collegiate, and business departments. The entrance requirements to the college are equivalent to the work of the preparatory department. The college course leads to the degree of A.B. There is a faculty of twelve members, and the enrollment of students in 1911-1912 was 204.

NORTHWESTERN UNIVERSITY, EVANSTON, ILL. — A coeducational institution, founded "in the interests of Christian learning," and chartered on Jan. 28, 1851. The charter provides that a majority of the board shall be members of the Methodist Episcopal Church, but no religious tests are required of students. The trustees chose as the first president Clark Titus Hinman. The university purchased 397 acres of land twelve miles to the north of the center of Chicago on the shores of Lake Michigan. Here the university was established and opened for instruction in 1855. The place was named Evanston in honor of Dr. John Evans, president of the corporation. The College of Liberal Arts was the only department of the institution until 1869, when the Chicago Medical College became a department of Northwestern University. The Law School, founded in 1859, became a department under sole control of the university in 1891. The College of Engineering was established in 1907, although for many years the university had offered courses in engineering in the College of Liberal Arts. The School of Pharmacy was incorporated in 1886 and became a department of the university the same year. The Dental School was organized in 1887 and was made a department of the university three years later. In 1895 the School of Music was established; the School of Commerce in 1908. A preparatory department was established at Evanston in 1859. On the campus, also, is Garrett Biblical Institute in close affiliation with the university.

The total enrollment of the university, 1911-

1912, including the enrollment in the affiliated schools, was 4344. The total enrollment in 1855–1856, fifty-five years previous, was ten. The growth of the university has kept pace with the development of Chicago, the city of its birth. Only one of the institutions of the Middle West that existed in 1850 has now a larger enrollment. The increase in material equipment is not less marked. In the first year the trustees collected on " the scholarship plan " $90,000, which represented practically their entire assets. Sixty years later the assets amount to about $9,000,000.

Expenditures for 1910–1911 were $740,297. The assets of all kinds for 1911 amount to $9,098,821. The value of buildings and grounds used for educational purposes, including libraries, museums, and sundry equipment, was $3,376,130, and trust funds, in addition to educational property located in the center of Chicago, was $4,555,766. The cash gifts for the year amounted to $288,175.

In Evanston are located the College of Liberal Arts, the School of Music, the College of Engineering, Garrett Biblical Institute, the School of Oratory, and Evanston Academy. On the south side of Chicago is the Medical School, and in Northwestern University Building, situated in the heart of Chicago, are the Law School, the School of Pharmacy, the Dental School, and the School of Commerce. In the Northwestern University Building is also the Gary Library of Law, one of the largest law libraries in existence. Northwestern University Settlement is situated in a congested district on the northwest side of Chicago.

J. C. B.

NORTON, CHARLES ELIOT (1829–1908). — Professor of the history of art at Harvard University and man of letters. After graduating at Harvard in 1846, he joined an East India counting house in Boston; he was sent, in 1849, to India and returned by way of Europe in 1851. In the following year he published anonymously *Five Christmas Hymns* and in 1854 a *Book of Hymns for Young Persons.* He still intended at the time to enter the ministry. In 1855–1857 and in 1868–1873 he was in Europe and made the acquaintance of the leading men of letters in England, including Carlyle, Ruskin, and Fitzgerald. He was a frequent contributor to the *Atlantic Monthly* almost from its establishment, and with Lowell he took charge of the *North American Review* from 1864 to 1868. In 1860 he wrote *Notes of Travel and Study in Italy.* He was appointed professor of the history of art in 1875 and held this office until he became professor emeritus in 1898. He organized exhibitions of drawings of Turner (1874) and Ruskin (1879). His reputation rests mainly on his work as an inspiring teacher and on his Dante studies and translations. He translated the *Vita Nuova* (1860 and 1867), and the *Divina Commedia* (1891–1892). In 1881 he founded the Dante Society. His other works include: *Historical Study of Church Building in the Middle Ages: Venice, Siena, Florence* (1880); *Letters of Carlyle and Emerson* (1883); *Carlyle's Letters and Reminiscences* (1886–1888); *Letters of Lowell* (1894); and as literary executor for Ruskin he wrote introductions to the American edition of his works.

NORTON, WILLIAM AUGUSTUS (1810–1883). — Textbook author and scientist; was graduated from the United States Military Academy at West Point in 1831. He held professorship in New York University, Delaware College, Brown University, and Yale College. He published textbooks on astronomy (1839) and natural philosophy (1858), and made numerous researches in molecular physics and terrestrial magnetism. W. S. M.

NORWAY, EDUCATION IN. — Norway, a constitutional monarchy, having an area of 124,129.7 square miles and a population of 2,392,698 (1910). The civil divisions for local government, which are also areas of educational administration, are eighteen counties (*amter*), towns, and rural communes (*herreder*); the latter are generally parishes or subparishes. The capital, Christiania, has a population of 243,801; Bergen has 76,917; and Trondhjem, 45,228. There are all together sixty-one urban communes. During the Middle Ages Norway formed an independent monarchy. In 1397 it entered the Calmar union with Sweden and Denmark, and when the union was broken (1527), Norway remained with the latter. By the terms of the peace of Kiel (Jan. 14, 1814) Norway was transferred from Denmark to Sweden. The union was effected only through the person of the King, Norway retaining its independent legislature. In 1905 the union with Sweden terminated, and the present King, Haakon VII, a son of the King of Denmark, was called to the throne. The Reformed Religion (Lutheran) was introduced into the kingdom in the fifteenth century and has exercised great influence upon the educational development.

Educational History. — Education was originally under the control of the Church, and it was the duty of the parish clergy to see that children were instructed in religion and in letters up to the time of their confirmation. When the constitution of 1814 was adopted, there were four classical (cathedral) schools in the kingdom; but even in these schools the mother tongue was treated as a separate branch, for Norway was never dominated by the classical spirit. An act of 1827 provided that there should be a permanent school near every principal church in the country, and ambulatory schools for isolated districts. There was, however, no marked educational movement before the political awakening in the third decade of the nineteenth century. Then arose the demand that national culture should reflect national ideals, and that it should rest upon a firm basis of elementary education supported by public authorities. In 1848 an act was passed by the Storthing providing for public elementary schools in the towns. This was followed in 1860 by a new act regulating rural schools, and in 1869 by legal provision for continuation schools. These acts were finally replaced by that of 1889, carried by the Liberal party, which pertained to both towns and rural parishes. This measure not only required that elementary schools should be provided, but prescribed in detail the organization and programs of the different grades of schools; for although local authorities are responsible for the establishment and maintenance of schools, the law has left nothing essential to their unlimited choice.

Under the awakened consciousness of national life and needs, the classical schools were the chief subjects of criticism; and the conflict between the older humanities and scientific and modern subjects was worked out through a series of laws and experiments, beginning with the law of June 17, 1869, and culminating in that of July 27, 1896, which determines the present organization of the middle and secondary schools.

Present System. — The national system of education in Norway is similar in many respects to the system of Sweden and Denmark, (*qq.v.*), but places greater emphasis upon practical training and modern subjects. It is noted for the complete provision of schools, for their adaptation to the different classes of society and the close coördination of the several orders of education.

The Department of Education and Ecclesiastical affairs has control of the system. The administration of primary schools is committed to school directors, one for each of the six dioceses of the kingdom. Bishop and Dean take part in the general supervision of the schools, and the clergy may supervise the religious instruction.

The Primary Schools. — In each municipality (town or division of a county) there is a local board (*skolestyret*) which consists of a priest, the chairman of the municipal council (or one of the aldermen), one of the teachers chosen by the body of teachers, and additional members (men and women) chosen by the municipal council. In the towns, at least one fourth of the members so chosen must be parents who have children in the primary schools. The school board, which elects its own chairman, has charge of all the arrangements for the schools of the municipality, *i.e.* choice of sites, building plans, appointment of teachers, etc. Every year the board submits to the municipal council an estimate of the expenditures for the coming year.

The inspection of the primary schools is intrusted to a committee consisting of one member of the school board as chairman, and three members (men or women) chosen in towns by the parents of the children attending the school, and in the country by parents and the ratepayers in a school district. This committee maintains constant supervision of the schools and of children of school age. The school board and the board of inspection in the country districts may bring the affairs of the primary school before a meeting of the ratepayers of the district and parents of children attending the school, who live in the district. Certain questions must be discussed at the district meeting before they can be decided, *e.g.* whether corporal punishment may be administered, changes in the district regulation, etc. In the large towns, the school board appoints professional inspectors, and where there are several schools, as a rule, a headmaster to each.

For every county, there is a county school board, consisting of three members chosen by the county council. This board has charge of the common educational matters of the county, and makes proposals to the county council concerning the income and the expenditure for county schools.

School Provision. — In the country, every district included in a municipality must have a primary school with at least two classes, one for children from seven to ten years of age (infant school), and one for children from ten to fourteen. On account of the distances, the districts in many places are again divided into several infant school districts. In the towns, the primary school is divided into three divisions, intended respectively for children seven to ten years of age, ten to twelve, and twelve to fourteen. Each of these divisions may again be divided into several classes.

School Buildings. — Special buildings must be erected or rented for primary schools. In the country, however, in the infant school districts and in primary school districts that have less than twenty children of school age, school may be held in rotation in the houses of the inhabitants of the district, where sufficient room can be procured. These "ambulatory schools" are steadily decreasing in number.

Program of Studies and Time Allotment. — The subjects of instruction required by law for primary schools and the distribution of time are shown by the table on the following page, which comprises a typical program for a country school of two divisions and for a graded city school.

If optional branches are added to the regular program, instruction in these must be given in extra hours. In the city schools, foreign languages may be included and elaborate provision is generally made for domestic subjects for girls. In the most northerly counties, where the Finns and Laps are found, their native languages may be used as auxiliary to the Norwegian.

WEEKLY TIME-TABLE SHOWING THE DISTRIBUTION OF HOURS

Obligatory Subjects	Country School		City School						
	Divisions		Divisions						
	1	2	1			2		3	
			Class			Class		Class	
			1	2	3	4	5	6	7
Religion . . .	7	7½	6/2	6/2	6/2	4	4	4	3
Norwegian . .	8	7	12	10	8	5	5	5	5
Arithmetic[1] . .	5	6	5	4	4	4	3	3	3
Writing . . .	5	4	4	4	3	2	1	1	1
Geography . .		2		3	2	1	1	1	1
History . . .	3	2			2	2	1	1	1
Natural sciences		2				1	2	2	2
Singing . . .	2	2			1	1	1	1	1
Gymnastics . .		1½			2/2	2	2	2	2
Drawing . . .		2				2	2	2	2
Manual work .							2	2	2
Total hours	30	36	24	24	24	24	24	24	23

[1] Geometry is taken in the upper classes of the city schools.

The distinctions between city and rural schools illustrate the flexibility of the system. In the country, boys and girls are generally taught in the same class; in the city, in separate classes, with modified programs for the girls. The classes in the country schools should have a minimum of thirty-five pupils and should not exceed forty-five; in the city schools, the range is from forty to fifty. The number of school hours a week in country schools exceeds the number in the city schools; but the annual session in the country is shorter, comprising from twelve to eighteen weeks as against forty weeks in the city.

The standard to be attained by the primary school is fixed by law for religion only. In this subject a thorough knowledge of the main facts of Bible history and Church history, and of the Catechism, according to the Evangelical Lutheran creed, is required. In the other subjects, it is left to the school board to fix the standard; in most of the rural municipalities, however, the standard of the various subjects, and the time-table, are determined in accordance with the "Normal Plan," which after the passage of the act of 1889 was sent out by the Central Department as a guide. Its requirements are indicated by the model time-tables. The examinations and form of leaving certificates are determined by the local boards.

The educational movement in Norway was marked from the first by regard for physical development and training. The Swedish or Ling system of gymnastics was early introduced into the teachers' colleges and adopted in the city schools. Great attention has also been given to hygienic conditions, and the school buildings of Christiania, of Bergen, and of other populous centers are models in arrangement and in their equipment of baths, of gymnasiums, and rooms for manual training and domestic arts. The spirit and methods of instruction in the schools are also decidedly modern.

Instruction is free in all classes of public primary schools. Needy children receive their schoolbooks and material from the municipality. In Christiania of late years the municipal council has also voted the necessary funds for supplying all needy children with a meal every school day.

Teachers. — Teachers of primary schools are appointed by the local school boards. Both men and women are eligible for appointment, and in town schools there must be one teacher of each sex. Only those can receive permanent appointment who have completed the twentieth year of age, belong to the Established Church, and have passed a teachers' examination. About one third of the situations, however, may be filled on terms of three months' notice, and for these appointments, and for visiting and assisant teachers, no examination is required. There are two grades of teachers' examinations. The lower, which corresponds to the entrance examination of training colleges, covers what is requisite for a permanent appointment in an infant school in the country. The higher teachers' examination, or leaving examination at the training colleges, is required for a permanent appointment in the town primary schools, and in the second division of the country primary schools. The examinations are in charge of a committee consisting of three members, who also inspect the teachers' training colleges.

There are at present ten colleges for the training of teachers for the primary school, of which six are public, one for each diocese, and four private. The public colleges are free. In the private colleges, by the aid of government grants, a considerable number of free students are admitted. Candidates for admission, both men and women, must be at least in their eighteenth year, must pass an examination in the primary studies, and offer testimonials of good character. The course of training covers three years and includes all the subjects taught in the primary schools. To each of the public colleges is attached a one-year preparation class for teachers of infant, or lower primary, schools. The public colleges register about 520 students, the private colleges about 400.

For the training of teachers (men and women) in sloyd, needlework, domestic economy, gymnastics, drawing, singing, and writing, courses are held at longer or shorter interval, according to requirement. Holiday or "continuation" courses lasting five or six weeks are also held for teachers of the primary schools. In these courses, of which there is one in each diocese, particular attention is given to Norwegian history and natural science, and educational matters are discussed. Since 1894 summer courses of twelve days' duration have also been held annually at the University and at the Bergen Museum; these courses are especially intended to instruct teachers in natural science. The Government votes an annual sum, which of late years has amounted to 10,000 krones ($2680), towards traveling scholarships for primary school teachers. Several municipalities also provide traveling scholarships.

Salaries. — The salaries of teachers, which vary greatly in different places, are naturally highest in Christiania. In this city the head teachers receive 2600–3800 krones ($744–$1087), free residence and wood for fuel or compensation for it, calculated at 900 krones. Assistant men teachers receive 1400–2600 krones ($400–$744); women teachers 900–1500 krones ($258–$429). For the country the minimum salary is in the infant school: fourteen krones ($4) for each school week with thirty hours' instruction. In the higher divisions: 18 krones ($5.15) for each school week of thirty-six hours' instruction. In addition to this teachers in the country, who give at least twenty-four weeks' instruction in the year, enjoy four increases of salary, each of sixty krones ($17.16) yearly in the infant school and 100 krones ($28.60) yearly in the higher divisions, after respectively four, eight, ten, and fifteen years' service. Moreover, one teacher, at least, in each commune must be furnished, without charge, a house and a piece of land. Teachers are pensioned by the state.

Statistics of Primary Schools. — The efficient administration of the system is indicated by the large enrollment in the schools, about 370,000 pupils at the latest date reported (1909) or 15½ per cent of the population. Of the total 92,950 were in city schools. The teaching force numbered 8106, of whom 5611 (4183 men, 1428 women) were in the rural schools, or one teacher to every forty-seven pupils; the city schools employed 2495 (856 men, 1639 women), one teacher to thirty-three pupils.

The expenditure for the public elementary schools was 13,047,210 krones ($3,731,562), equivalent to $10 per capita of enrollment and to $1.54 per capita of population. Of the amount 42.7 per cent went to the support of city schools. The State appropriated 4,256,749 krones, equal to 32 per cent, of the total expenditure.

Sources of Support. — The State contributes one third of the regular salaries paid to teachers of primary schools. The remaining expenses fall upon the communes and the county funds. The latter, however, are derived from State grants to the amount of three fourths the total; the remaining fourth comes from the county revenues. These funds defray extra expenditures, *i.e.* increase of teachers' salaries for long services; aid toward the erection of school buildings; and provision of land for teachers or compensation for the same; educational apparatus; aid for poor municipalities; expense for substitute teachers to replace regular teachers in case of long illness; for continuation schools and artisan schools (*arbeidskoler*).

The annual expenditure from public funds for teachers' colleges (*laererskoler*) not included in the totals above given is about 255,000 kr. ($73,000). A small proportion of this amount goes to private training colleges.

Schools for Defectives. — Public provision for the education of children is completed by schools for defectives, *i.e.* the deaf, blind, and imbecile children. This work, which is under a director attached to the central department of education, is regulated by a law of 1881 and subsequent amending laws. In respect to general instruction, the aim of the schools for defectives is the same as that of the primary school; in addition the pupils are educated for a practical life. The school courses extend, as a rule, over eight years. Deaf children are admitted at the age of seven, blind children at the age of nine, and imbeciles, at present, at the age of fourteen or fifteen.

The latest statistics relating to these schools are as follows: —

Institutions		Pupils			Teachers		
Classification	Number	Boys	Girls	Total	Men	Women	Total
For the Deaf	5	171	157	328	36	31	67
For the Blind	2	90	52	142	13	10	23
For the Feebleminded	3	259	238	497	20	53	73

The institutions considered are all maintained by the State, which also supports a school for blind adults.

Abandoned and Vicious Children. — By the act of June 6, 1898, which went into effect in 1900, Norway took an advanced position in regard to neglected children and those who need special restraint. The age of criminal responsibility was raised by this act from ten to fourteen years and it was required that young criminals below fourteen instead of being punished should be brought under moral influences and properly instructed. Children who commit crimes after having completed their fourteenth year, are liable to punishment; but until they reach the age of sixteen, educational measures may be employed with them. The act is applicable, also, to children who are in danger of becoming burdens to society either as lazy idlers or as criminals and convicts. Such children under specified conditions may be placed in the care of the State. The charge of children who come within the provisions of the act is committed to boards of guardians, formed in every municipality and consisting of a judge, a clergyman, and five members chosen for a period of two years by the municipal council. One of these members must be a medical man living or practicing in the municipality, and one or two must be women.

The boards of guardians have authority to remove a child from his parents and place him in a trustworthy family, or home, or in an institution, such as a reformatory school, or a *skolehjem.* If the board of guardians consider that the child may be left with his parents, they may warn both him and his parents and in certain cases may punish the child as merited.

A reformatory school may be erected by a single municipality or by several in conjunction. Its plan must be approved by the King. Children that are so depraved morally that their attendance at the ordinary school would be injurious to other children may be committed to a *skolehjem.* These institutions are of two classes, one for specially depraved children, and one for the wayward. The former are erected by the State, for boys and girls separately. At Bast, near Christiania, one has been built to accommodate 150 boys. A similar establishment for girls has been founded near Christiania. The more lenient institutions may be private or municipal, but must conform to the legal requirements.

The state charge of children that are removed from their parents ends when the cause ceases and as a rule is not continued after the child has completed his eighteenth year. Children that have been placed in reformatories of the strictest kind may, however, be kept there until they have completed their twenty-first year. The supervision of this class of children pertains to the Ecclesiastical and Educational Department. The cost of the work is divided between the State and the municipalities.

Continuation Schools. — Provision for continuing the education of youths and adults after the period for attendance upon primary schools is made by a variety of agencies: the ordinary continuation schools (*Fortsaettelsesskoler*) with sessions of from one to six months a year are intended for young people, fifteen to sixteen years of age, who have been out of school for a year or two and who wish to review their studies. These schools in 1909 numbered 166 with 2455 pupils (1628 males, 827 females). The expenditure was 68,613 krones ($18,388), of which 65 per cent was from public funds. Evening schools, intended for pupils seventeen to nineteen years of age, offer special courses, covering, on an average, instruction for fifty hours in the year. They numbered 569 in 1908 with 8299 pupils (of which 5516 were young men). The expenditure was 52,240 krones ($14,940), of which 88 per cent was from public funds.

County schools are similar in purpose to People's High Schools which were introduced from Denmark (*q.v.*). The former, however, which are maintained by public authorities, place special emphasis upon practical or technical subjects, *i.e.* in the schools for men, or mixed schools, upon drawing and sloyd; in the schools for girls only, upon needlework and domestic arts. The teachers of these schools are generally taken from the staff of the primary schools or, for the higher studies, from the force of secondary professors. The annual session is from six to seven months; schools for women only three months. The latest statistics show thirty-nine county schools with 1580 pupils (881 men, 699 women) and fifteen People's High Schools with about 650 pupils; of these a little more than half were men. The state subsidizes both classes of schools.

City evening schools and the county schools in some cases have developed into what are termed Working Men's Colleges. In these institutions adult men and women are instructed in the phenomena of nature, in the duties and relations of social life, and in the progress of knowledge and its industrial results. The first college of this class was erected in Christiania in 1885, and this example has since been followed in several towns and rural districts. The public libraries, which number about 700, coöperate with this work.

Secondary Education. — Public secondary schools are under the general direction of the Department of Ecclesiastical and Educational Affairs. For the inspection of the schools and the arrangement of the leaving examinations, there is a council of seven members competent in matters of higher education; in respect to hygienic matters an expert is called to the assistance of the council.

The public secondary schools are either state or municipal schools. Each of the former is managed by a special board consisting of the head master, one member appointed by the Department, and three by the municipal council. The municipal secondary schools may be managed by the local school board, or by a special board. The principals and permanent teachers of the state schools receive their appointments from the King and are government officials. The municipalities provide the school premises, buildings, and equipments; the current expenses are met by government grants, fees, and endowments. The municipal schools are also supported in part by government grants. Their principals and permanent teachers are appointed by the Department of Public Instruction and their qualifications and salaries are practically the same as for teachers of the state schools.

There are also many private secondary schools of the same standing as the public schools.

By the law of 1896 provision is made for two orders of secondary instruction, the lower based upon the primary school, the higher leading up from the lower to the university. In its complete form, the lower secondary school (*middelskole*) comprises four progressive classes, the course terminating with an examination (*middelskoleeksamen*). This school is coördinated with the second division of the city primary schools, the age for entrance being eleven years; if the school has less than four classes, the age and standard are correspondingly higher.

The gymnasium (higher secondary school) comprises three progressive classes leading to the *examen artium* which is required for admission to university studies. To enter the gymnasium, the applicant must be at least fifteen years old and must have passed the *middelskoleeksamen*. The course of the gymnasium is uniform for the first class, at the end of which there is bifurcation into the modern side and the linguistic-historical side. The latter may include a Latin section, although by the law of 1896 the classical languages (Latin and Greek) are relegated to the university. In connection with the first class of the gymnasium, or with the lower secondary school, there may be arranged a one year's course for pupils who intend soon to enter business life. Both classes of secondary schools are, in general, coeducational. The girls gain relief from excessive work, either by spending two years in a class or by taking only one foreign language and a short course in mathematics, a privilege accorded to boys also. The programs of the two orders of instruction are shown by the following time-tables: —

SPECIMEN TIME-TABLE FOR A *MIDDELSKOLE*

SUBJECTS	CLASSES			
	1	2	3	4
Religion	2	2	2	1
Norwegian	5	4	4	4
German	6	5	5	5
English		5	5	5
History	3	2	3	3
Geography	2	2	2	2
Natural Science	3	2	2	3
Arithmetic and Mathematics	5	5	5	5
Drawing	2	2	2	2
Writing	2	1		
Gymnastics	3	3	3	4
Manual Work	2	2	2	2
Singing	1	1	1	
Number of hours a week	36	36	36	36

Girls are instructed in domestic economy in extra hours.

SPECIMEN TIME-TABLE FOR A GYMNASIUM

	MODERN COURSE			LINGUIST HIST. COURSE WITHOUT LATIN			LINGUIST HIST. COURSE WITH LATIN		
	Classes			Classes			Classes		
	1	2	3	1	2	3	1	2	3
Religion	1	1	2	1	1	2	1	1	2
Norwegian	4	5	4	4	6	5	4	5	4
German	3	3	3	3	3	3	3	3	3
English	4	2	2	4	7	7	4	2	2
French	4	2	2	4	4	3	4	5	
Latin								7	11
History	3	3	3	3	5	5	3	3	3
Geography	1	1	2	1	1	2	1	2	2
Natural Science	4	5	5	4	1	1	4	1	1
Arithmetic and Mathematics	4	6	6	4	2	2	4	2	2
Drawing	2	2	1	2			2		
Gymnastics Singing	6	6	6	6	6	6	6	6	6
Number of hours a week	36	36	36	36	36	36	36	36	36

The division of the time assigned to gymnastics and singing is left to the managers of the different schools.

The vacation amounts to twelve to thirteen weeks in the year, of which seven weeks are in the summer. Every school day comprises six periods of forty-five minutes each. Six hours in the week, as a rule, one hour a day, must be given to physical exercises, manual work, and singing.

Teachers. — The staff of the state secondary schools consists of principals (*Rektors*), head teachers, and assistant teachers, men and women. There are also special teachers for gymnastics, singing, sloyd, domestic economy, etc. The teachers acquire their theoretical training at the university. The course of training which covers about six years is terminated by an examination (*laerereksamen*). After passing this examination the candidates must take a half-year course at the pedagogical seminary of the university, and are then examined in pedagogics, school method, and psychology. Simultaneously with this course the candidates gain practical experience in teaching at an appointed school.

The salaries are per annum: —

For principals	4600–5400 kr.[1]	($ 1315 to $ 1544)
For head teachers	3200–4400 kr.	($ 915 to $ 1258)
For assistant teachers . .	2200–3200 kr.	($ 629 to $ 915)
For women teachers . . .	1200–1700 kr.	($ 343 to $ 486)

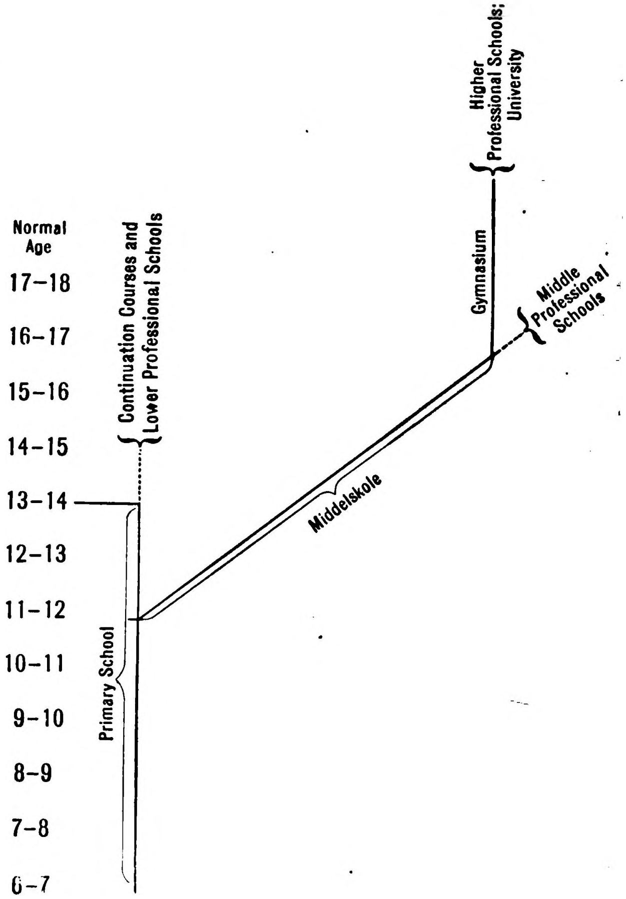
[1] Also free residence.

Statistics of Secondary Schools. — There are 14 state, 5 communal, and 7 private schools having gymnasium classes and authorized to prepare pupils for the *examen artium*; in addition there are 52 schools (45 communal and 7 private) that stop with the middle school examination. The total number of pupils in all classes of secondary schools in 1909 was 17,104, distributed as follows: Gymnasium classes, 1725 (of these 444 were girls); middle schools, 11,435 (girls, 5333); one year preparatory, 3944 (girls, 2252). The number of teachers in the secondary schools was 1313, including 813 men and 500 women.

The expenditure for the public secondary schools of both orders is met by state and local appropriations, endowment funds, and tuition fees. The fees are fixed for each school according to circumstances. In 1909 the expenditure amounted to 2,203,225 kr. ($630,122). Of this amount the State bore 35 per cent and the local appropriations 16 per cent or a little more than half the whole amount.

In addition to the schools referred to above, there are several municipal and private schools without the examination rights, in which instruction is given beyond the scope of the primary school. These schools have a freer arrangement than the *middelskoler*, and have as a special object provision for the higher education of girls. In 1909 there was one communal school of this class in Christiania with 40 pupils (all boys) and 89 private schools. Of the latter there were, for boys only, 9 schools with 416 pupils; for girls only, 4 schools with 244 pupils; and 76 coeducational schools with 2890 pupils (1634 boys; 1256 girls).

Coördination of Schools and Higher Institutions. — The system of public education is completed by the universities and by special technical schools. The close relation of the various classes of schools to each other, which facilitates the passage from one to the other, is illustrated by the accompanying diagram.


Higher Professional Schools; University
Normal Age
17–18
16–17
15–16
14–15
13–14
12–13
11–12
10–11
9–10
8–9
7–8
6–7
Continuation Courses and Lower Professional Schools
Gymnasium
Middle Professional Schools
Middelskole
Primary School

Technical Education. — Technical schools, which are found chiefly in the towns, are of two orders, the lower technical schools which pupils may enter from the elementary school, and a higher order based upon the *middelskole.* The lower technical schools include (1) technical evening schools with three-year courses, comprising annual sessions of 8 months with instruction for 10 hours a week; (2) public drawing schools; and (3) industrial schools for girls with one-year courses in handicraft, and domestic arts. To this order belong also the Christiania Technical School; School of Mechanic Arts of Skiensfjorden; School for Wood and Metal Work at Bergen. Of a somewhat higher or more specialized character than the above named schools are the following: middle technical schools at Trondhjem, Christiania, and Bergen, having four-year courses and requiring for entrance the leaving examination of the lower secondary schools (*middelskoleeksamen*); an elementary mining school at Kongsberg with a course of two and one half years and twelve hours' session a week (age of entrance, eighteen years); commercial gymnasiums at Christiania and Bergen with courses of two years for men and one year for women; 22 schools of navigation; for the promotion of rural industries the following: agricultural schools, 19; schools of gardening, 16; dairy schools, 6; 1 agricultural high school.

The technical schools of the highest class comprise 6 schools of engineering, and a technical institute of dentistry. For promotion of the fine arts there are two national schools, the Royal industrial art school, and the conservatory of music, both at Christiania.

The University. — The Royal Frederick University at Christiania was founded in 1811, and began its operation in 1813 with 11 professors, 3 lecturers, and 18 students. In 1912 it had 70 professors, 14 "docents," 19 fellows, and 1500 students. The university comprises five faculties, each of which elects its own president, or dean, for a term of two years. The deans form the academic council which constitutes the university's board of management subordinate only to the Ecclesiastical and Education Department. The university professors receive their appointments from the King. The minimum salary is 4500 kr. ($1206) with three additions of 50 kr. ($134) each after 5, 10, and 15 years' service. The 20 oldest professors, moreover, have an addition of 60 kr. each. The "docents" are also appointed by the King. The fellows, who have only a limited amount of lecturing to do, are appointed for one year at a time, by the university council.

The gymnasium leaving examination (*examen artium*) is required for admission to the university. The instruction is free, but fees are paid for admission to the various examinations (from $5.36 to $10.72). Before students can go up to any of the university degree examinations, they must have passed a preparatory examination, *examen philosophicum*. In this examination, philosophy is a compulsory subject; the five remaining subjects may be chosen by the candidate from science, languages, history, mathematics, etc. The time of preparation for the *examen philosophicum* is 2 or 3 terms. The average time required to work up for the various examinations is as follows: 9 terms for theology; 8 for law; 14 for medicine; 10 for philology, and 10 for "real students." Clinical facilities are afforded medical students in two government hospitals whose head physicians are university professors. Theological students get their special training at a theological college connected with the university. There are various collections, laboratories, and scientific institutions belonging to the university. Among them are the University Library (350,000 volumes) which is also the National Library, with a reading room open to any one for several hours daily; the Botanical Gardens, the Historical Museum, the Astronomical and Magnetic Observatory, the Meteorological Institute, and the Biological Marine Station at Dröbak. The income of the university for 1910-1911 was 910,280 kr. ($243,955). Of this amount 64 per cent was supplied by the state appropriation. There was also an appropriation of 225,000 kr. for the library and of 7400 kr. for new laboratory buildings.

The principal scientific societies are the Royal Literary and Philosophical Society at Trondhjem, founded in 1760, which has a library of about 7000 volumes, and the Literary and Philosophical Society at Christiania, founded in 1857, with which is associated the Fridtjof Nansen Fund for the promotion of science; the capital of the fund, at present, amounts to about 450,000 crowns ($120,600). The Bergen Museum, founded in 1825, is a center of scientific activity in the western part of Norway. It possesses valuable collections, especially of natural history, a scientific library, and a biological station with laboratories, aquaria, etc. There are also Museums at Trömso, Stavanger, and Arendal, with natural history and historical antiquarian collections. For the preservation of "Ancient Norwegian Monuments" there is an association, founded in 1844, supported by a government grant.

The Norwegian National Museum, founded in 1894, at Christiania, collects and exhibits everything throwing light upon the culture life of the Norwegian people. The industrial arts museums at Christiania, Bergen, and Trondhjem possess valuable collections and have had great influence in promoting beauty of design in the embroideries, copper utensils, silver jewelry, etc., for which Norway is noted.

The public expenditure for education in 1909 was 20,307,886 kr. equivalent to $5,442,514. Of this total the state treasury furnished 8,955,289 kr. or 44 per cent. A. T. S.

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NORWICH UNIVERSITY, NORTHFIELD, VT. — The earliest of American military colleges after West Point, was opened at Norwich, Vt., by Captain Alden Partridge in 1820, located at Middletown, Conn., 1825–1829; returned to Norwich in the latter year, and removed to Northfield, Vt., in 1857. It was chartered under its present name in 1834. Its founder sought to enrich the curricula of his day by adding thereto: physical training; laboratory and field practice in science; engineering; agriculture; the mechanic arts; and military science and practice under military discipline. (See *Lecture on Education,* 1819.) Much of this he put into practice at Norwich and some came quickly into use elsewhere, although agriculture and the mechanic arts lagged forty years before they were adopted. Of Norwich students of 1835–1865 living in '61, with records now known, 69 per cent found service in the armies and navies of '61–'65, 58 per cent as officers. The Norwich History, covering the records of its students, evidences the founder's wisdom and foresight in departing from the conventional college plan of his day. The essentials of his plan have been retained but modified as experience has dictated, save that the elective system, which he was among the first to adopt, has long since passed away. According to the history named, the total enrollment to date has been 3853; graduates 809. Students now enrolled number 183; professors 14. The departments of instruction lead to the Bachelor degrees in Arts, in Science and Literature, in Chemistry, in Civil and Electrical Engineering.

C. H. S.

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NOSE, HYGIENE OF THE. — The nose may be called the hygienist or health inspector among the senses. In normal condition it tests the sanitary condition of the environment, of the air we breathe, and the food that we eat. Also it warms and moistens and purifies the air, and nasal respiration is essential to the proper nutrition of the brain. In its care certain obvious rules of hygiene are important. Children should be taught proper habits and methods of cleanliness, not to blow their noses violently, and not to put things into them. Injuries to the nose should be attended to; for accidents, blows on the nose, falls from trees or walls or gymnastic apparatus, may cause deviation of the septum.

Anything that causes partial or total occlusion of the nostrils, like injuries to the septum, deformed growth, adenoid growths, hypertrophy of the faucal tonsils, the swelling of the mucous membrane in colds, or the like, is hygienically a serious matter, since it is likely to cause defects of speech, defects of hearing, interference with the brain activity and with growth and development and the health in general. The most common cause of defective hearing is probably some nasal trouble, especially an adenoid growth. Nasal breathing is of primary importance not only for the health of the pupil but for efficient school work. The improvement in the mental ability after the removal of adenoids (*q.v.*), causing mouth breathing, has been a commonly observed result; and special tests made by the German specialist Kafemann, in which the ability of his subjects to add simple numbers was tested, in one series of experiments with the nostrils open, and in another with the nostrils occluded artificially, showed that the occlusion interfered with the mental activity and less work could be done.

It is important for the teacher to know the essential facts in regard to the hygiene of the nose. A child suffering from adenoids, for example, is liable to be treated unjustly and unwisely on account of irritability or disorderly conduct. The child is likely to be inattentive and backward in school work. Parents may be ignorant of the child's condition, and neglect is likely to mean a serious handicap in mental and physical development, speech defects, constant danger from colds, and ultimately deafness. (See Adenoids.)

The main points emphasized by recent investigations may be summed up briefly as follows: (1) The hygiene of the nose is of prime importance both for the health of the individual pupil and for the sanitation of the schoolroom; and the obvious rules in regard to cleanliness, care for injuries, and the like are emphasized. (2) Health inspection should always include careful examination of the upper air passages, the nose and naso-pharynx. (3) Nasal breathing is an important condition of efficient brain activity, and occlusion of the nose from any cause should receive special attention. (4) The most common permanent cause of occlusion of the nostrils is hypertrophy of the nasal pharangeal tonsil, the so-called adenoid growth. This trouble is likely to be found in at least 5 or 6 per cent of the school children in perhaps most of the schools of this country. (5) While there is no consensus in regard to the specific cause of adenoids, the growth is apparently connected with the greater activity of the lymphoid tissue in childhood. (6) Adenoids are apt to occur in the early years before the age of six, and frequently they are found at birth. (7) The operation for adenoids is usually successful; it should not as a rule be performed before the child is six months old; but it is very desirable that the adenoid should be removed at least before the age of six years, in order that healthful development may not be hindered. (8) It is desirable that careful examination of the nasal cavities should be made in the case of all children on entering school life. When adenoids or the like are found, parents should be advised of the condition of their children and the need of proper treatment. (9) No child should be sent to a school for the feeble-minded or the like without first being tested by a competent specialist to determine whether the mental retardation be not caused in part by an adenoid growth. (10) The hygiene of the nose and nasal breathing is of such importance for the actual work of the school that all teachers should be taught the main facts in regard to the subject.

W. H. B.

See Adenoids; Ear, Hygiene of; Medical Inspection.

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NOSS, THEODORE BLAND (1852–1909). — Normal school principal; was graduated from the Shippensburg (Pa.) Normal School in 1874 and from Syracuse University in 1880. He subsequently studied at the Universities of Jena and Berlin in Germany and Paris in France. He was one of the founders of the Herbart Society in America and was active in movements concerned with the scientific study of education. He was principal of the State Normal School at California, Pa., from 1883 to 1909, having previous to his appointment as principal been an instructor in the institution. His publications include *Outlines of Psychology and Pedagogy* (1890), *Child Study Record* (1900), and numerous articles in educational reviews. He was the editor of *School Year Books,* a series of manuals for teachers in the elementary schools.

W. S. M.

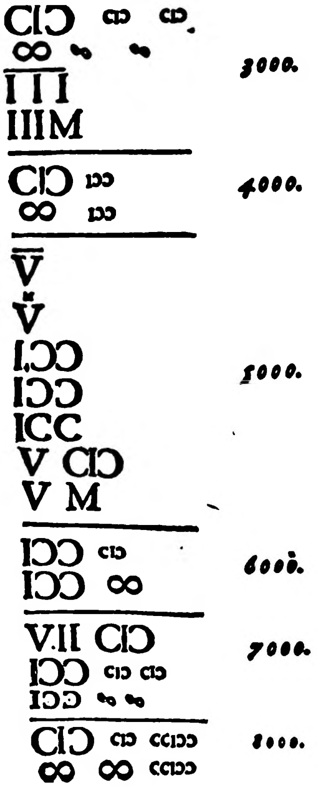
NOTATION. — A word used in arithmetic to mean the writing of numbers, as distinguished from numeration, which is taken to mean the reading of numbers. This distinction is a modern one and is of no particular value, representing as it does the tendency to extreme classification of the eighteenth and nineteenth centuries rather than any educational necessity. Notation comes from *nota,* a word used by medieval writers to indicate a numeral in the Hindu-Arabic system. Thus Clichtoveus (1503 edition) and Tzwivel (1507) speak of the *nota circularis* for zero, and Noviomagus (1539) has a chapter *De notis numerorum.*

At present, in the teaching of arithmetic, it is common to speak of Arabic notation and Roman notation, meaning thereby the writing of the Hindu-Arabic and the Roman numerals. There are, however, many numerals besides these, not only those of the past but also those used in many parts of the world to-day. In our American and European schools, however, only these two are taught, and the Roman system is rapidly losing its importance.

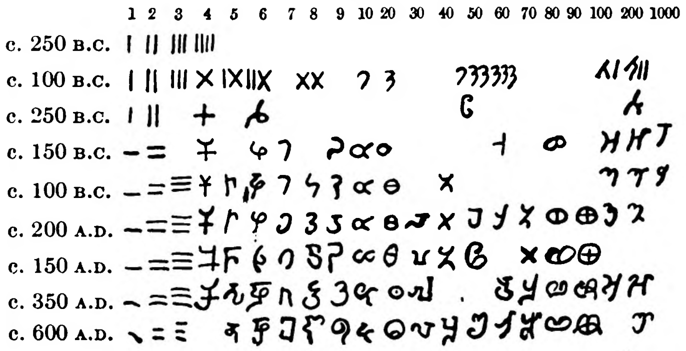
Roman Notation. — The late Romans used the symbols I, V, X, L, C, D, and M. They had no generally recognized system for the writing of large numbers, although Pliny and occasionally other writers used a bar over a numeral to increase its value a thousand fold. Thus $\overline{\text{X}}$ meant ten thousand. In general, however, large numbers were written out in words. The Romans made some use of the subtractive principle, IX meaning $10 - 1$, while XI meant $10 + 1$. This principle sometimes extended to a double subtraction, as in the case of IIXX for eighteen (*duo de viginti*). On the other hand, it was rarely used in the case of four, IIII being preferred to IV, as the clock face still witnesses. The subtractive principle appears in the case of XIX for nineteen, but rarely in the case of CD for 400, the Romans preferring CCCC. The form MCM for 1900 is purely modern, the Romans using MDCCCC.

The origin of the Roman notation has been a matter of much speculation. In general, however, the symbols are thought to come from certain Greek letters that were not used in making up the Latin alphabet. In particular, L is thought to come from Ψ, C from Θ, and M from Φ. D (for 500) is half of the early form for 1000. Possibly V was suggested by a cancel mark across IIII, and X is two V's; or X may be derived from crossing out ten I's, and V may be half of it. This latter seems probable, since the five is occasionally found as an inverted V, thus: Λ. There are various other theories, but nothing in the early inscriptions thus far known has developed anything definite beyond the one above given.

The late Roman numerals differed considerably from those of the classical period, as is seen from the following table from the *Mysticæ numerorum significationis liber* of Bungus (Bongo), published at Bergamo in 1583–1584.

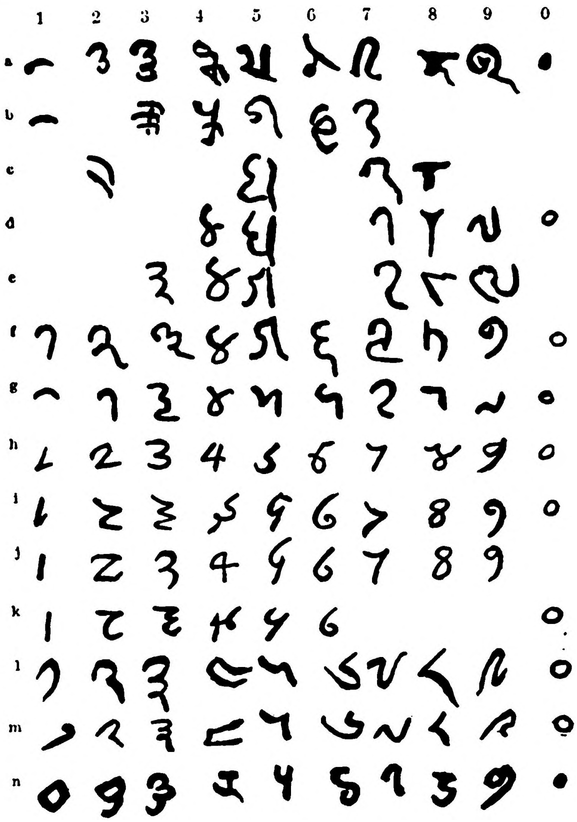

3000.
4000.
5000.
6000.
7000.
8000.

The Hindu-Arabic Notation. — What are commonly called the Arabic numerals are of Hindu origin. The earliest trace we have of them is in certain inscriptions of the third century B.C., cut on stone in India in the time of King Aśoka. The following table shows some of the earliest forms: —


1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100 200 1000
c. 250 B.C.
c. 100 B.C.
c. 250 B.C.
c. 150 B.C.
c. 100 B.C.
c. 200 A.D.
c. 150 A.D.
c. 350 A.D.
c. 600 A.D.

It will be observed that the zero does not appear, but that separate symbols for 10, 20, and so on are necessary. This was the case in many ancient systems of notation.

Without the zero it is impossible to have a place value, and since the oldest inscription in which the place value is evident dates from 595 of our era, we may say that the zero was a product of the sixth century. The earliest undoubted inscription in which zero appears, however, is found in Gwalior, India, and dates from 876 of our era, although there is one manuscript that probably antedates this in which a dot is used for zero. By the time the place value was established the numerals had changed to such forms as the following: —

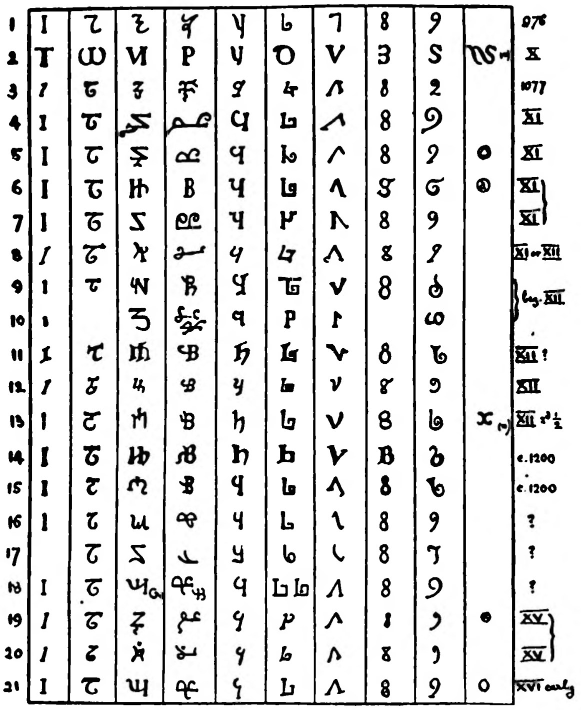

1 2 3 4 5 6 7 8 9 0
a
b
c
d
e
f
g
h
i
j
k
l
m
n

It is uncertain when the numerals began to be known in Europe, but by the tenth century they had reached Spain and probably were somewhat known in Italy. The forms at this period differ somewhat from those of India, as may be seen from the table on the following page.

Among the earliest writers of prominence to recognize the value of these numerals was Fibonacci, Gerbert, and Sacrobosco (*qq.v.*). After printing from movable type was invented, in the fifteenth century, the forms of the numerals, like those of the letters, became quite definitely fixed, although there is still some variation in different countries, particularly in the written notation.

Scales of Notation. — Our common system of notation is based upon the scale of ten. For example, 2405 means 5 units + 0 tens + 4 times the square of 10 + 2 times the cube of 10. This comes from the fact that we have ten fingers, and the fingers formed the primitive abacus. (See ABACUS; FINGER RECKONING.) It is apparent, however, that systems of notation might be devised on various

Earliest Manuscript Forms



scales. For example, if the scale of twelve were selected, we should need two more numerals, say *t* for ten and *e* for eleven. Then the number 9t3e would mean $11 + 3 \cdot 12 + 10 \cdot 12^2 + 9 \cdot 12^3$, and this would be 17,039 on our ordinary scale of ten. In some respects the scale of twelve would be more convenient than the scale of ten. For example, when we reduce the most commonly used fractions to decimal forms we have: $\frac{1}{2} = 0.5$, $\frac{1}{3} = 0.3333+$, $\frac{1}{4} = 0.25$, $\frac{2}{3} = 0.6666+$, $\frac{3}{4} = 0.75$, $\frac{1}{8} = 0.125$, and so on. But these fractions are expressed more easily on the scale of twelve, thus: $\frac{1}{2} = 0.6$, $\frac{1}{3} = 0.4$, $\frac{1}{4} = 0.3$, $\frac{2}{3} = 0.8$, $\frac{3}{4} = 0.9$, $\frac{1}{8} = 0.16$, and so on.

Educationally, the study of different scales of notation has no place in the elementary school. It is an interesting generalization in algebra, but its value to the average pupil is easily exhausted. D. E. S.

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NOTEBOOK METHOD. — Many secondary schools and some elementary schools are placing an increased emphasis upon the notebook as a means of recording observations and readings in history, geography, nature study, elementary science, and other subjects. It is a successful device for holding the student responsible for results and for directing him toward definite and accurate impressions and ideas. As a method, given undue importance, its use possesses several distinct dangers. The pupil may become mechanical in the recording of notes, without bringing reflection to the organization of his experiences; his notetaking may become a mere copying of the statements of teacher or text, and lead to waste in recording facts which are unimportant save as preliminaries in obtaining fundamental conclusions. H. S.

NOTION. — The term is closely related to the term idea, but usually refers to an idea which is not clear, or to that aspect of an idea which is not explicit. One says that he has a notion of what the author means, but no clear idea. The term is very little used in technical writings. C. H. J.

NOTKER. — The family name of a number of famous scholars of the Middle Ages, all of whom are probably related to one another. The earliest of these was *Notker Balbulus*, or the Stammerer (c. 840–912), who was educated at St. Gall and there studied Greek, Latin, music, poetry, and the Scriptures. He became master of the school and for a time was librarian. He was the composer of poems and songs, including, it was thought, the anthem *Media Vita in Morte Sumus*, and introduced the sequences into Germany. He was the teacher of *Notker Physicus*, who showed great ability in music, painting, writing, and medicine, and won favor at the court of Otto I.

The most famous member of the family was *Notker Labeo*, or the Thick-lipped (c. 950–1022), a nephew of Ekkehard I. He was a good student of music, poetry, mathematics, astronomy, the Scriptures, the Church Fathers, the classics, and the vernacular. He was regarded as the greatest scholar of his day, but his chief title to fame was his encouragement of the use of the vernacular. He himself translated a number of works into Old High German, *e.g.* Boethius, *De consolatione philosophiæ*; Capella, *De nuptiis Philologiæ et Mercurii*; Aristotle, *De categoriis*; the *Psalms*; Terence, *Andria*; Vergil, *Eclogues*. He was also the author of an essay in German on musical instruments. The surname Teutonicus was given to him in recognition of this work. In a letter found at Brussels Notker recommends the study of the classical works as a preparation for the study of ecclesiastical writings, and urges the translation into the vernacular for greater ease of comprehension.

Of greater influence than his predecessors was *Notker* (c. 940–1508), Bishop of Liège, formerly Provost of St. Gall, with which he seems always to have been in touch. He was an enthusiastic teacher and was always surrounded by a group of scholars over whom he exercised an excellent influence and to whom he willingly gave his books. Pupils flocked to the Cathedral School at Liège, where provision was made for externs or lay students, and interns, or students who looked to the priesthood, whither they were sent by the parents and clergy. Liège thus became a center from which teachers were sent to most parts of northern Europe. Of the pupils who had studied under Notker seven attained to bishoprics.

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NOTRE DAME, SCHOOL SISTERS OF. — See Religious Teaching Orders of the Roman Catholic Church.

NOTRE DAME, UNIVERSITY OF, NOTRE DAME, IND. — One of the most famous Catholic institutions of higher learning. It was founded in 1842 by the Very Rev. Edward Sorin and was chartered in 1844 by the Legislature of Indiana. The University is conducted by the Congregation of the Holy Cross. Until 1865 only a college of arts and letters was maintained. In that year the college of science was added. In addition there are colleges of engineering (1872), architecture, and law (1869), and a preparatory school. Students are admitted to the college after graduation from a four-year high school. The usual degrees are conferred on undergraduate and graduate students on completing the appropriate courses (three years in the college of law, four years in the other colleges). Twenty buildings, valued with their equipment and apparatus at $2,800,000, are devoted to university purposes. From the University Press is issued *The Ave Maria*, a literary and religious magazine with contributions from the best writers in Europe and America. Notre Dame also awards each year the Laetare Medal to some Catholic layman for distinction in some branch of learning. The faculty consists of 85 members. In 1911–1912 the enrollment of students was 987.

NOTT, ELIPHALET (1773–1866). — College president; was born at Ashford, Conn., June 25, 1773. He was privately educated and was graduated from Brown University in 1795. For two years he was principal of the academy at Plainfield, Conn. Later he went as a missionary to Cherry Valley, N.Y., where he established an academy and served as both pastor and teacher. After a brief pastorate at Albany he accepted in 1804 the presidency of Union College, which he held until his death. Although the institution was established nine years before he became its president, Dr. Nott was the virtual founder of the college. He was a member of its board of trustees from the first; and it was during his administration that it rose to collegiate rank. The engineering school, the medical school, and the Dudley observatory were organized during his administration. The discipline of the college under his presidency was parental. He made military drills a feature of the collegiate work for purposes of physical training; and he introduced courses in gardening and agriculture. He was active in the organization of the American Association for the Advancement of Education (*q.v.*), and was its second president. In addition to his participation in various national and state educational movements, he was an ardent advocate of temperance, antislavery, and religious and civil liberty. He was a student of applied physics all his life, and secured patents on thirty different scientific devices. One of these was the first stove used for burning anthracite coal. His publications include *Counsels to Young Men* (1845), *Lectures on Temperance* (1847), and numerous pamphlets and addresses. He died at Schenectady, N.Y., Jan. 29, 1866. W. S. M.

See Union College.

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NOTTINGHAM, UNIVERSITY COLLEGE, ENGLAND. — An institution founded in 1881 by the " Mayor, Aldermen, and Citizens of Nottingham for the advancement of university learning." A higher literary and scientific education is provided for students over sixteen years of age. A Royal Charter of Incorporation was obtained by the college in 1903. The following departments are maintained: language and literature, including most of the " arts " subjects; chemistry and metallurgy; physics and mathematics; natural sciences; engineering. A Day Training Department is maintained in connection with the Board of Education. In the technical branches, courses with a special bearing on the local lace and hosiery industry are provided. There are no conditions of admission beyond general fitness to profit by the courses.

The College does not grant degrees, but prepares students for the examinations of the University of London. The title of Associate of University College, Nottingham may, however, be conferred. The College also has power to grant a diploma in mining engineering. The majority of the students are enrolled in the evening classes. The enrollment in 1910 was 607 day and 1718 evening students. The College receives grants from the Treasury, the Board of Education, the Nottingham City and County Councils, and subscriptions for special purposes from many private sources, *e.g.* the Drapers' Company.

Reference: —

England, Board of Education. *Reports from Universities and University Colleges.* (London, annual.)

NOWELL, ALEXANDER (?1507–1602). — Dean of St. Paul's and educationist of Queen Elizabeth's reign, born at Read Hall, Whalley, Lancashire. Alexander was educated at Middleton, near Manchester, and "entered Brasenose College at the age of thirteen (*i.e.* 1520); he resided there thirteen years; and he afterwards bestowed on the society thirteen scholarships." He is said to have taught the textbook of Rudolphus Agricola at twenty years of age. In 1543 he became Master of Westminster School, described as being then "the chief seminary in the kingdom," which post he held till 1555, when he was succeeded by Nicholas Udall (*q.v.*). Nowell was diligent in teaching Terence for "pure language" and the original Greek of St. Luke's Gospel and the Acts of the Apostles for "true religion." Nowell was made a Prebendary in Westminster Abbey, and in 1553 was elected M.P. for Leo in Cornwall, from which position he was required to retire on the ground of "having a voice in the Convocation-house." After a few years in exile during Mary's reign, he returned and was made Dean of St. Paul's. Nowell was a consulting educationist in the establishment of schools. The Skinners' Company School at Tonbridge (established by Sir Andrew Judd) brought their statutes for revision to Nowell. He himself founded a grammar school at Middleton in Lancashire and provided scholarships at Brasenose College, Oxford. He drew up the statutes for the organized Friars school at Bangor, and nominated the schoolmaster at Colchester. He himself was actually principal of Brasenose College, Oxford, for a short time. But, as an educationist, Nowell's name is most closely associated with the catechisms which he drew up and presented to Convocation in 1562. These seem to have been three in number; a larger one suitable for Universities drawn up at the suggestion of Lord Burleigh, which summarized the doctrines of the Church of England, was written in Latin, and first printed in 1570. This was translated into English by Thomas Norton in the same year, 1570. The middle (size) catechism was also published in Latin in 1570 and translated into English by Thomas Norton in 1572. The *Catechismus parvus* was published in 1572. All the sizes were translated into Greek by William Whitaker. The small catechism of Nowell took its position in the school manual of religion as the chief and was used in the English schools of the sixteenth and seventeenth centuries. F. W.

See Catechisms.

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NOVA SCOTIA, EDUCATION IN. — See Canada, Education In.

NOVA SYLVARUM. — See Bacon, Francis.

NOVUM ORGANUM. — See Bacon, Francis.

NUMERALS. — See Notation.

NUMBER. — The primitive idea of number was that of a collection of units, unity itself being excluded. (See Unity.) It was not until about the opening of the seventeenth century that the view of unity as the source of number, but not itself a number, was modified. This is only one of many extensions of the primitive idea, others being seen in the gradual inclusion of fractions, irrational numbers, complex numbers, transcendental numbers (*qq.v.*), and so on. There is no satisfactory elementary definition of number that covers all of the possible types, but Newton's definition of number as the ratio of one quantity to another quantity of the same kind answers the purposes fairly well. Thus the ratio of 4 ft. to 1 ft. gives the positive integer 4, and its reciprocal gives the positive fraction $\frac{1}{4}$. The ratio of the diagonal to the side of a square gives the irrational number $\sqrt{2}$, and the ratio of a circle to its diameter gives the transcendental number π.

The distinction between abstract and concrete number is modern, number being essentially abstract in any case. In the sixteenth century the distinction appears in several works. Trenchant (1566), for example, speaks of the absolute or abstract and the denominate number (*L'absolu . . . abstrét* and *le denommé*). In his category of denominate numbers he included not only 3 ft., but 3 fourths ($\frac{3}{4}$). (See Denominate Numbers.)

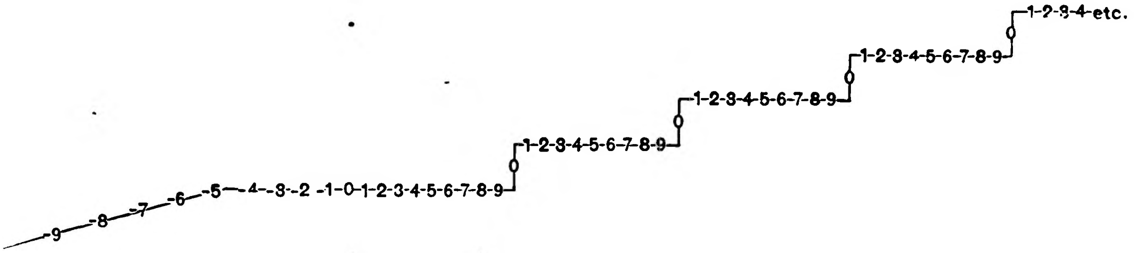
One of the oldest classifications of numbers is that based upon finger symbolism. (See Finger Reckoning.) Numbers were divided into digits (fingers), articles (joints), and composites. In the geometry attributed to Boethius (*q.v.*) these three classes are said to be due to "the ancients" (*veteres appellare consueverunt*). They do not seem to have been known to Pliny (*q.v.*) and Apuleius, however, because they both speak of finger symbolism, but make no mention of these names. The digits were the integers from one to nine, that is, below the "first limit" (*infra primum limitum*), which was ten. Since, however, one was not considered a number, the digits were often considered to be only eight in number, as by Peletier (1549), who says: "ce sont les huict figures, 2, 3, 4, 5, 6, 7, 8, 9." It is only in relatively modern times that the word has come thus to be used to represent the characters instead of the numbers themselves. Gemma Frisius (1540), for example, uses digit to mean a number, the figures being called characters or elements (*characteres siue elementa*).

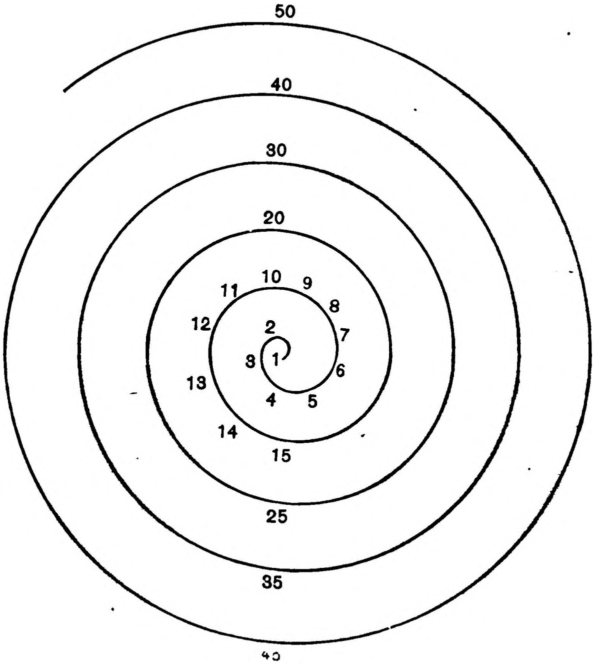
The articles were the multiples of ten, sometimes limited to nine in number (10, 20, . . . 90), but usually unlimited (*et in infinitum progressi*, as a work often ascribed to Boethius gives it). Articles were later called "decimal numbers" (*numbre desenal*, Pellos, 1492; *lo numero decenale*, Ortega, 1515), and as such they finally disappeared.

The composites were numbers composed of articles and digits, as 17, 48, 256, etc. The word, however, had another meaning; namely, that of a number that is not prime. This latter meaning finally dominated the other, and is the one now recognized. On account of this double meaning some writers of the sixteenth and seventeenth centuries spoke of a digit plus an article as a mixed number (*q.v.*) or a compound number (*q.v.*), terms that have since been applied to other forms of number.

The oldest known manuscript on arithmetic in the English language, perhaps of *c.* 1300, has this classification: "Some numbur is called digitus latine, a digit in englys. Somme numbur is called articulus latine. An Articul in englys. Some nombur is called a composyt in englys." This classification was found in most of the medieval books on theoretical arithmetic, but was usually wanting in the commercial works. It was unwieldy, because it allowed for only eight or nine digits, but an unlimited number of articles and composites. Many attempts were made to avoid the difficulty, with two resulting plans: (1) to drop the whole thing, as Leonardo of Pisa (*q.v.*) did at the opening of the thirteenth century, recognizing, as Ramus (*q.v.*) did much later, that it was puerile and fruitless (*puerilis et sine ullo fructu*), or (2) to attempt to classify the infinite number of composites. The latter plan was followed by Sacrobosco (*q.v.*) in the thirteenth century, who elaborated the classification of limits, but did not produce a system that any one seems to have understood.

For other forms of number see the following special topics. FIGURATE NUMBERS; FRACTIONS; IRRATIONAL NUMBERS; MIXED NUMBERS; NEGATIVE NUMBERS. D. E. S.





NUMBER FORM. — A mode of imaging numbers, peculiar to some individuals. Most individuals, in thinking of numbers, make use of various forms of mental imagery, differing according to their individual types, as, for example, visual, auditory, or mixed. Those who use number forms are visualists, who arrange the numbers in a definite spatial order with reference to each other, and with each number occupying a definite spatial position. The spatial relationships which the numbers thus assume are various, but the form always remains the same in the same individual. The figure shows two such number forms, the first of which was used by a student and the second of which was substituted for the first at a later period. It has been held that thinking of numbers in such concrete terms is an awkward mode of conceiving the number relationships, but those who use number forms assert that they are very useful, particularly in connection with the keeping of engagements and the remembering of dates in history, etc. Similar forms are often used in connection with the thinking of the days of the week, months of the year, and the seasons. There is some evidence to show that the tendency to think in terms of such forms is inherited, as the tendency seems to be common to members of the same family. In general, these phenomena may be grouped under the class of phenomena called synæsthesia. Synæsthesias are held by some authorities to be more frequently found in adolescents than persons of other ages. E. H. C.

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NUMBER, PSYCHOLOGY OF. — Psychologically there is a stage of evolution of consciousness of quantity which precedes the development of the number idea. One recognizes the presence of all the articles of furniture in his room, or the withdrawal of familiar articles, without going through the elaborate process of counting. Animals are able to recognize that one of their young has been taken away without being able to count. This direct recognition of quantity is, however, very limited. As soon as the objects grow at all numerous a special system of one to one designation must be developed or the individual object will be lost in the mass. This necessity of marking the objects in large groups undoubtedly furnished the practical motive which drove primitive man to the use of his fingers and to the use of pebbles, shells, or other devices for counting.

After a number system was developed, the next stage of development consisted in the discovery of number relations. Given three objects and two objects, there is always a like result from the bringing together of the two groups. The discovery of the relations of numbers was a slow process. The ancient Greeks were greatly interested in certain characteristics of number groups and built up a body of speculative philosophy around such simple matters as the indivisibility of prime numbers. In sharp contrast, however, to their large contributions to geometry, they did not contribute to the technique of number manipulation to any great extent.

The slow evolution of number ideas in the western world is due in large measure to the clumsy and unsuggestive terminology which grew up especially in the written symbols.

From a purely psychological point of view, one further general consideration may be pointed out. It is often urged that number problems be made concrete, that the interests of children in the schools may be aroused by combining number work and shop work. Indeed, some have gone so far as to suggest that number operations be allowed to arise incidentally out of school work, the number work being motivated by the necessities of measurement which confront the pupil. In reply to these proposed reforms, it is to be pointed out that the number idea is an abstract idea, different in character from the idea which is derived directly from the inspection or manipulation of any object. The number idea develops by the cultivation of a technique of number operations wholly different in character from the technique of direct constructive manipulation. That this abstract, highly developed system of ideas will ever grow up incidentally is an idle hope. Number consciousness must be carefully cultivated, and number operations must be mastered by a concentration of attention on these operations. No amount of illustrative material will give rise to number ideas. C. H. J.

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NUMBER WORK. — See Mental Arithmetic.

NUMERALS. — See Notation.

NUNS. — See Convent School; Religious Teaching Orders of the Roman Catholic Church.

NURSERY. — See Infant Education; Kindergarten; Nursery Rhymes; also Child Psychology.

NURSERY RHYMES. — Those rhymes, ditties and jingles, rhythmic stories and nonsense verses that have been recited or sung to children time out of mind. The most universal of them are sporadic and have grown out of the universal personal relation of mother and child — others are the débris of ancient folklore; bits of old ballads; rhyming, and therefore easily remembered, riddles, proverbs, etc., that have caught the ear of infancy. The unerring instinct of mother, nurse, and child has seized upon those scraps and snatches which were best suited to the awakening senses of the infant and without knowing that they were obeying a great psycho-pedagogical law mothers and nurses have for centuries been stimulating the sense of rhyme and rhythm, and exciting the wonder, fancy, and imagination of the children, with the material that awakens the best response and has the greatest educative value at the infant stage.

The elements in them which are so attractive to the infant ear and mind, are doubtless, first of all, the rhyming jingle, as in *Higgledy piggledy my fat hen*; then, perhaps, the nonsense surprises, as in *Hey diddle diddle the cat and the fiddle*; *Three wise men of Gotham*; *I'll tell you a story about Jack a Nory*; and then the dramatic action as in *Little Miss Muffet* and *Little Jack Horner*. The most popular with children are generally those in which all these elements are most markedly present.

While no one knows when or where the majority of these nursery rhymes originated, many of them can be traced back to their sources; but it would overstep our space to attempt to point them out. Halliwell indicated the origin of several, but many more have been traced since he wrote. As most of them have been handed down by word of mouth for centuries, there are many variants of them to be found among English-speaking people everywhere, and the part of England from which the early settlers of certain sections of the United States came may often be suggested by the variant of a nursery rhyme which prevails among them to-day.

Early Collections of Nursery Rhymes. — Orally current for centuries, this "light literature of the infant scholar," snatches of which are caught in the literature of all the ages, was not collected in English until about the year 1756, when John Newbery, Oliver Goldsmith's friend and publisher, brought out in London *Mother Goose Melody, Sonnets for the Cradle, in Two Parts.* "Part I," ran the title, "contains the celebrated songs and lullabies of the good old nurses calculated to amuse the children and to excite them to sleep; Part II, those of that sweet songster and nurse of wit and humor, Master William Shakespeare, embellished with cuts and illustrated with notes and maxims, historical, philosophical, and critical." It was almost immediately afterwards reprinted by Isaiah Thomas, the famous printer of Worcester, Mass.

The immediate source of the name *Mother Goose* is to be found in *Les Contes de ma Mère l'Oye* — the title which Charles Perrault chose for his collection of fairy tales published in French in 1697. These were not published in English until 1729, but *Moeder de Ganz* and Mother Goose were already familiar in nursery rhymes which had been orally current for many years, and John Newbery appropriated the name Mother Goose for more than one of his little books.

At the time this book was compiled Oliver Goldsmith was in the constant employ of the publisher Newbery, editing his little books, concocting his advertisements, writing his prefaces, devising his title pages, etc.; and there is little doubt that he and Newbery made this collection together. The nursery rhymes are annotated in a jocose and sometimes rather coarse style that would hardly suit modern tastes.

This collection went through a few editions in England and in America and then, under the influence of the dreary tendencies of the time, the nursery rhymes were neglected for a long period in books, though they continued to live in the hearts of the children and in the hearts and minds of their mothers and nurses.

Some of them, however, were from time to time appended as "fillers" to other little books by Newbery and other publishers of books for children who immediately succeeded him, and Joseph Ritson published in 1810 a collection of them under the title of *Gammer Gurton's Garland, or the Nursery Parnassus, a Choice Collection of Pretty Songs and Verses for the Amusement of all Little Good Children who can neither read nor run.*

With the beginning of the interest in folklore the nursery rhymes naturally attracted the attention of students and collectors, and in 1841 Halliwell printed his first collection for the Percy Society. Halliwell has enriched his collection of these rhymes and jingles with many valuable notes, and his book has been the storehouse from which all the later collections of nursery rhymes have been taken. Although he utilized the collections already made, there is no doubt that many of the rhymes in his book were collected for the first time from oral tradition, as his collection is much larger than any other. But the Newbery book was evidently unknown to him or to Ritson, as neither of them makes any reference to it in his preface. It was really not until 1844, or thereabouts, that the collection took strong hold of the American people, although, of course, the rhymes had been imported into the country and were orally current here, as in the mother country, from the earliest colonial days. The Boston editions of Monroe and Francis, issued between 1824 and 1860, have probably tended more than anything else to keep Mother Goose alive in this country. The most complete edition, which included Halliwell's notes and nearly all the illustrations that had been made up to that time for *The Nursery Rhymes*, called the Camden Edition, and compiled by Mrs. Valentine, was published sometime after the latter date. It is now out of print and scarce.

An absurd story was set on foot in the preface to an edition of the nursery rhymes published in 1877 to the effect that Mother Goose was a Boston woman and that she wrote and her husband, a printer, published the first collection of the nursery rhymes in 1719. The story is based on the statement of some one who thought he had once seen a fragment of such a book, but no one else ever saw or heard of it. Mr. W. H. Whitmore's *The original Mother Goose Melody*, 1892, tells all that can be told of the story and utterly explodes the myth of a Boston Mother Goose.

Analysis. — The best way, perhaps, to study the range of the English nursery rhymes in order to get a view of their educational value and interest, is in certain divisions and groups which to some extent follow the progress of the development of the perceptions and interests of the children. (I) The Mother-play division contains those nursery rhymes which grow out of the intimate personal relationship of mother and child: the groups in which are the lullabies, cradle songs, slumber songs, etc.; the finger plays and other games of mother and child. (II) The Mother-stories division comprises stories about animals; stories about other people; the times, seasons, etc.; rhyming ABC's; proverbs and riddles; paradoxes, etc.; cumulative stories. (III) The Child-play division includes counting-out rhymes and children's games.

The Mother-play Division. — The first thing the baby hears is *the lullaby* or *the cradle song*, such as *Hush a bye, baby*, etc. — The earliest nursery rhymes said or sung to the infant are accompanied by movements and gestures; the sense of touch is used to aid the memory. Some of these are called *finger plays*, such as *Pat a Cake, Pat a Cake*; *Tickle ye, tickle ye in your hand*; *Brow Bender*; *Dance Thumbkin, dance*, etc.; and with their appropriate movements they are among the first games that awaken childish glee. The feet as well as the fingers figure in some of these, such as *This little pig went to market.*

Froebel, the founder of the kindergarten, first made definite educational application of these plays and tales. The first collection of these, the *Mutter- und Koselieder*, was published in 1844. (See further, FROEBEL and KINDERGARTEN.)

Other rhyming games with movements in the division of mother plays are the *Dancing* and *See-saw* rhymes, such as *Dance, little baby*; *See-saw secradown*; *Ride a Cock-horse*, etc.

The Mother-stories Division. — In this division children early make acquaintances with animals and their doings as in *Ding Dong Bell*; *Three Little Kittens*; *I love Little Pussy*; etc. Stories about other children and the doings of older folk such as *Little Boy Blue*; *Robin and Richard*; *Jack and Gill*; *Little Tom Tucker*; *Tom, Tom, the Piper's Son* form another considerable group. The flight of time, days and nights, weeks, months, and years, the sun, moon, and stars, the seasons and the weather, etc., furnish subjects for another, which may be illustrated by *Cock Crows in the Morn*; *March Winds and May Flowers*; *Thirty Days hath September*; *Rainbow at Night*, etc. The most typical of the rhyming ABC's, of which there are several, is *A was an apple pie*; of the riddles, *Two legs sat upon three legs*; *Old Mother Twitchett*; of the proverbs, *See a pin and pick it up*; of the paradoxes, *Three children sliding on the ice*; *There was a man of our town*; *If all the world was apple pie*; *There was an old woman and what do you think?* *The man in the wilderness asked me.* The cumulative stories, of which *This is the house that Jack built* or *The Old Woman and her pig* may be taken as the type, are among the oldest known in this group. No form of narrative is so easy to remember as this, — and it is small wonder that it is one which particularly appeals to the child.

The Child-play Division. — The third division into which the nursery rhymes fall, that of *child play*, embraces the important group of "counting-out rhymes" in which the fingers are employed; of these there are literally hundreds, each with countless variations in different districts. Familiar examples are *Eeny, meeny, miny, mo*; *Intery, mintery, cutery, corn*; *Eena, deena, dina, duss*; *Handy, pandy, Jacky, dandy*; *Onery, two-ry, ickery Ann.* The subject of the rhymes of this class has been very fully treated by Mr. H. Carrington Bolton in his *Counting-out Rhymes of Children* (London, 1888). This group also includes dramatic games and games of skill and chance. Miss Alice B. Gomme in her *Study of Children's Games* has classified all the dramatic games under the incidents which show the customs and rites from which the games have descended. The customs shown in the games are, among others, those connected with marriage, love, and courtship, funerals, harvest, well worship, tree worship, foundation sacrifice, witches, child-stealing, and divination. There are contests between two rival parties for the taking of prisoners and the possession of ground territory, and contests between animals of prey and their victims; those games dealing with marriage, love and courtship, funerals, and harvest, are the most popular and the most widespread. Among these games may be mentioned; *Nuts in May*; *Here we go round the Mulberry Bush*; *London Bridge*; *Orange and Lemons.* The guessing game of *Buck, buck, how many fingers do I hold up?* through the modern Italian *mora* has been traced to ancient Greece.

Distribution of the Nursery Rhymes. — The nursery rhymes furnish a rich field of study from the historical and sociological point of view, the point of view of the folklorist, and many others, but their chief interest to the educator lies in the foregoing presentation. It may, however, be instructive to glance at the remarkable distribution of the nursery rhymes all over the world. Every nation has its nursery rhymes and jingles and there is a very close family resemblance in all of them. Counterparts of many of our English nursery rhymes are found among the ancient Hebrews, the Zulus of South Africa, and the Indians of North America. The closest resemblances are to be found among those nursery rhymes which are concerned with things personal to the mother and child, the lullabies, the finger play and dancing games, and the stories of the cumulative order. Those in the other divisions differ somewhat in scheme and general idea, and still more in detail, especially as we approach the didactic rhymes, alphabets, proverbs, riddles, and paradoxes. National characteristics, religion, climatic and other conditions, of course, are responsible for many divergencies of detail. *L'Amour* and *Rondes du Mariage*, the dancing rhymes and games play a far more important part in children's rhymes and games of the continent of Europe than in our more Puritanical collection. The devil and the evil eye figure very frequently in the nursery rhymes of Southern France and of Italy, and these bristle with allusions to the method of warding off the effect of the *jettatura*, such as, for example: *Si tu rencontras le diable? Je lui ferai mes cornes.* The game of honeypots as played in France has a religious and a superstitious side as well. It is the good God who comes to buy a pot of flowers; when the selection is made, the one who is selected is treated as in the English game, the devil is supposed to get the one God does not buy, and all the others make the sign against the evil eye as they chase him away.

But perhaps these national characteristics are more markedly shown in all languages in the children's riddles and counting-out rhymes. The riddles, many of them, play on the same words and subjects as do ours; others deal with matters of which we do not openly speak, especially among our little ones; most of the counting-out rhymes are constructed upon pretty much the same plan as our own familiar groups already cited, and are as numerous and varied; some of them also contain things which we could not tolerate, and God and the devil, priests and nuns constantly figure in them.

The German *Kinder-reime*, *Liedchen*, *Spiele*, and *Märchen* are, as might be expected, more fantastic and fanciful, and thus approach more nearly to the character of the Swedish and Danish, which have a peculiar sweetness, grace, and charm. The children of Holland and the Flemish folk have a very wide range of traditional nursery literature, and in sound and in sense they approach very closely to those of England. The characteristics of the people of the olden times come out here very strongly. Eating and drinking and wife-beating figure prominently in them, and ships and cows and sheep take the place of other objects which figure in the rhymes of other countries.

There are probably more nursery rhymes in China than can be found in England and America. Mr Isaac Taylor Headland has in his possession over six hundred, collected, for the most part, in two out of eighteen provinces. In many of these rhymes there are features common to our own Mother Goose.

C. W.

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NURSES, CHILDREN'S. — Infant Education.

NURSES IN SCHOOLS. — See Medical Inspection of Schools; Contagious Diseases.

NURSING, EDUCATION FOR. — **Historical.** — Among the occupations of women, nursing ranks among the oldest. It is indeed hardly possible to conceive of a time in human history when mothers did not care for their children and for the sick and helpless of their families. The slowly accumulated skill and knowledge thus gathered through the experience of primitive women, and passed down by tradition to successive generations, built up the rudiments of primitive nursing, which, mingled with those superstitions which have ever clustered about the sick bed, became a substantial part of the basis of primitive medicine. The records of ancient civilizations, Egypt, India, Greece, Rome, show the growth of medical and sanitary knowledge, discuss physicians of various types, describe hospitals, and lay down elaborate procedures for the care of the sick. There is little mention made of nurses, but it seems probable that certain nursing services were rendered by the "temple-women" or "priestesses," since it was the common custom to bring the sick to the temples for healing, where religious ceremonial could be combined with practical measures of care or treatment.

Between the nurses of the pre-Christian era and our own the historical links are broken, but there is a continuity of record from the days of the early Christian workers down to the present time. With the diaconate of the early church, the history of Christian nursing begins, and from the earliest apostolic days the care of the sick and poor was placed in the hands of deacons and deaconesses, who were consecrated by the church and ranked with the clergy. Their chief functions were to visit and care for the sick in their homes, to assist the needy and to comfort the afflicted. They also brought the sick with them into their own homes to be cared for. The order grew steadily, spread far and wide into other countries, and lasted for several centuries. Eventually it became so strong that restrictions were placed upon its activities and freedom; it was brought into stricter subjection to the clergy, declined in importance, and was finally abolished altogether in the sixth century.

The order of deaconesses may well be looked upon with respect, as having laid the foundation not only of nursing but of modern works of charity. It was replaced by monastic communities which had in the fifth century become numerous and important, and were already exercising guardianship, under the control of the church, over the hospitals and other charitable institutions, which were multiplying in response to the spirit of the time. With these communities begins the history of the religious nursing orders whose work among the sick presents a shining record of heroic and devoted service, covering a period of over a thousand years. Among the more famous orders, the Franciscans (*q.v.*), the Augustinians, and the Benedictines (*q.v.*) have been especially noted for their work among the sick. For twelve hundred years the Augustinian Sisters formed the nursing staff of the Hotel Dieu in Paris, and from this ancient order came the hospital sisters who in 1639 crossed the Atlantic to establish in Canada a place where the sick could be cared for.

There were many other nursing orders not all truly monastic in type. The Crusades early in the Middle Ages brought into being the illustrious military nursing orders, and the Knights Hospitallers became famous for their splendid system of hospitals, an interesting example of which is found in the old hospital of St. John at Valetta. Other nursing orders were the free secular associations, of which the Beguines of Belgium formed the most interesting example. They showed an effort away from the rigid formalism of the monastery toward spontaneous self-expression in work and life. Their little houses clustered around the hospital and nursing was their important activity. One of the most famous and the largest of all nursing orders is that of the Sisters of Charity, founded by St. Vincent de Paul in 1634. Recent data showed this order established in twenty-four countries, and working, either serving or directing, in about 2000 hospitals and other institutions. The sisters have an honorable record of service in epidemics, war, and other disasters, and several have been decorated by France with the Legion d'Honneur. Altogether, the records of the religious nursing orders are among the most splendid pages in history and their contributions to human welfare among the most valuable.

The suppression of the monasteries was followed by a time of great hardship for the sick poor. No new system was available to replace that of the religious orders, the sick were more and more relegated to the care of servants and attendants, the art of nursing was neglected, the status of the nurse became extremely low. Writers agree that in all matters relating to hospitals and the care of the sick a period of stagnation set in during the latter part of the seventeenth century, lasting until the early part of the nineteenth. The condition of nursing during the eighteenth century is clearly shown in John Howard's reports of hospitals and lazarettos, and the typical nurse of the early nineteenth century has been immortalized by Dickens in *Martin Chuzzlewit*. The servant nurses of this period show nursing brought down to a state of marked degradation. They had become free from any control or supervision of women, and were everywhere almost entirely subject to male officials. They were ignorant and untaught, overworked and underpaid, ill-housed, ill-fed, and held in contempt. No elevating or enlightening influences reached them. Where the religious orders had seen in their work among the sick a direct and living service to God, these persons saw only disagreeable, laborious tasks, illumined neither by religious zeal nor by scientific knowledge. Nursing became simple, hopeless drudgery.

Nineteenth Century Reforms: Kaiserwerth. — While the actual reform in nursing began with the founding of the School for Deaconesses at Kaiserwerth on the Rhine, there were various factors and influences leading up to it. The continued existence of small groups or communities of women selected to work among the sick poor, usually in connection with the church, often consecrated with religious ceremonies, showed that the order of deaconesses had never wholly died out. The form only had changed. The spirit and service remained, and these groups of workers among the sick and poor were virtually deaconesses. The hope of reviving the ancient churchly order was frequently expressed by some of the clergy during the eighteenth century, and pamphlets were written urging it. Groups of such workers were seen by Pastor Fliedner, the founder of the Kaiserwerth Schools, among the Moravians and Mennonites in Holland, and the profound impression they made on him had doubtless a direct influence in the formation of his plans.

During the latter part of the eighteenth and early in the nineteenth centuries there were interesting attempts at formulating instruction in nursing. A number of small nursing manuals appeared, and in several places courses of instruction for hospital attendants were offered. The more noteworthy manuals were those of Dr. May (*Unterricht für Krankenwärter*, Mannheim, 1784) and Dr. Pfahler (*Unterricht für Personen welche Kranke warten*, 1793), in which principles of nursing as well as details were discussed. These were widely read at the time, and may be looked upon as important early contributions on this subject.

Courses of instruction for male nurses were established in Magdeburg, Prussia, at the end of the eighteenth century, and institutes for hospital attendants were founded in Vienna in 1812; in Strassburg in 1814; and at the Charité Hospital, Berlin, in 1830. Writers of the day speak of the opposition to these efforts, which were apparently looked upon as a dangerous innovation. The courses offered usually covered two or three months, and consisted solely of lectures by physicians. There could, of course, be no practical teaching without nurses to teach their practice, and thus only the principles of nursing, but not nursing itself, could be taught. A certificate was given at the School for Attendants in Berlin, and, as there was an old Prussian law relating to these, here may perhaps be found the earliest example of the recognition of a legal status for nurses. A stimulus more direct perhaps than any of these, was the wonderful activity of the women of Germany in hospitals and among the sick during the War of Freedom. A plea for a definite revival of the diaconate, which would provide Christian women to do Christian nursing, was made by Fliedner, who points to the work of these women in projecting his plans for the Training School for Deaconesses, which was later established at Kaiserwerth and jointly directed and developed by himself and his noble wife Fredericke. The importance and significance of this revival of the evangelical order of deaconesses can only be fully understood by careful study of the movement and the time. The plan of training embraced many activities, but so far as nursing is concerned the whole development of the modern system may be traced directly through its founder, Florence Nightingale, to this school where she first went to study nursing methods.

The fundamental principles upon which the system of training in nursing was based were that the hospital and other institutions existed only to provide suitable places for training the pupils; that systematic and continuous instruction was indispensable; that nurses could not be narrow specialists, and must be thoroughly prepared in every phase of their work. For this purpose some time must be passed in each department to insure familiarity with all; and most important of all was the large authority given to the woman at the head, the matron who was made responsible for the entire arrangement of work, its control and direction, and the discipline of the pupils, — the restoration of an office which had long been extinct in the civil hospitals of the time. The general plan and system of work was substantially that of the modern training school, so closely have the lines then laid down been followed. The candidate was required to bring letters from clergyman and physician. There was a period of probation to test the personal and moral qualities, as well as the mental and physical. There was a preparatory department; the pupil was under no expense for living or tuition, and received a small allowance. The work was graded, and so were the workers, through several ranks. The chain of responsibility was unbroken from probationer to superintendent.

Nursing training was given in the hospital, where the pupil was to be taught the care of acute, chronic, and special cases, and parish or visiting nursing among the poor, thus following in the footsteps of the older religious orders. A large place was given to religious work, and nursing was but one branch of the training of deaconesses. The organization shows strikingly the combined influences of ecclesiastical and military ideals. The title of Sister (which still exists in many European and all English hospitals to-day), the time devoted to religious exercises and teaching, the insistence upon self-sacrifice as a part of a nurse's armamentarium came down from the religious nursing orders. The sharply defined organization for the fixing of responsibility, deference to superiority in rank, unquestioning obedience to command, precision of orders, forms, reports, and records, all bespeak military traditions. But the introduction of a system of training and teaching, the humane attitude towards patients as individuals, the respect for labor, the comparative freedom of opinion and action which were developed at Kaiserwerth were all new. The deaconess was not a nun under another garb. She represented a new idea, — that education and training for work were essential. Kaiserwerth, in fact, with its system of theory and practice, may perhaps be looked upon as an early instance of an attempt at genuine vocational education, and as such would justly claim to have set in motion far-reaching and permanent influences.

The Kaiserwerth deaconesses now number many thousands. They have branch houses all over Germany and in foreign countries; have under their care numerous convalescent hospitals, orphanages, infant schools, special schools for blind, deaf and dumb, though the educational system and ideals of the Fliedners have not been generally maintained. The life and work of the deaconess have come more and more closely under clerical control; and restrictions, economic on the one hand, and intellectual and social on the other, have placed her out of the stream of nursing progress. In parish and mission work, however, she is still an important and beneficent factor.

From Kaiserwerth came the impetus which resulted in the first effort in England to give practical training to nurses. Mrs. Elizabeth Fry visited Kaiserwerth in 1840, and was so deeply impressed with its system and methods that on her return she brought about the establishment in London of an Institute for Nursing which was connected for practical purposes with Guy's Hospital. In 1848 St. John's House, an Anglican Nursing Order, and connected with Kings College Hospital, was founded in London. The preliminary plans call it "a collegiate institution" to prepare for work among the sick. Several writers, physicians and others discussed in the periodicals and press of the early nineteenth century the education of women for the care of the sick, and Southey contributed in his *Colloquies in Society* an interesting and suggestive presentation of the subject as it then appeared. Plans, projects, and actual effort had, however, one distinctive feature. They provided a religious or semireligious order of workers, and reproduced with more or less fidelity the forms of the past.

The Work of Florence Nightingale. — The creation of a new order, the establishment of new principles, and the founding of a system to develop and perpetuate them was the work of a famous English woman, Florence Nightingale. While Miss Nightingale is best known throughout the world for her remarkable work in army nursing and sanitary reform during the Crimean war, her greatest contribution to human welfare must ever lie in the system of education in nursing which she originated, established, and virtually endowed at St. Thomas's Hospital, London, in 1860. Miss Nightingale (born in 1820) came of a family of wealth, social position, and public spirit. She was highly and thoroughly educated in mathematics, natural science, classics, and languages, and had traveled extensively. She was by nature a student and an investigator. Careful mental training and discipline placed her in a position to work effectively, and her natural interest in the sick, which was displayed at an early age, led her to that prolonged and searching study upon which her brilliant achievements in sanitary and hospital reform rest. She sought every available opportunity for personal observation and study of the sick for practical experience, was twice at Kaiserwerth in training, and devoted years to a careful and exhaustive study of hospitals, organization, and nursing methods in every European country. In the awful crises of the Crimean war, the English government turned to her as the one person qualified not only by special genius, but by special and severe preparation, to handle the colossal problems of sickness and suffering in the army, and to render the great services which her country needed. Her experiences and observations there are embodied in invaluable works on sanitary reform in the army, but the vital and permanent results of her work were the removal of old conceptions of nursing as a charity, a self-sacrificing labor for others, a meritorious act leading to heavenly reward, or a penance; and the recognition of nursing as a part of sanitary science, and of pity and palliation as unacceptable substitutes for prevention. Miss Nightingale's own view of nursing should be presented. "Nursing is putting us in the best possible condition for Nature to restore or to preserve health, to prevent or to cure disease or injury . . . to enable Nature to set up her restorative processes; to expel the intruder disturbing her rules of health and life. . . . Partly, perhaps mainly, upon nursing must depend whether Nature succeeds or fails in her attempt to cure sickness. Nursing is therefore to help the patient to live. Nursing is an art, and an art requiring an organized practical and scientific training. For nursing is the skilled servant of medicine, surgery, and hygiene."

The Nightingale School, founded by the contributions of a grateful British public to Miss Nightingale, was established on the following basis. It was secular and nonsectarian. It had a close, organic relation to a hospital of high standing with adequate facilities for teaching and experience. All practical work was based on careful teaching. Hospital officers in medical and nursing departments were specially paid for teaching; the head nurses for practical teaching, the medical men for lecturing, the matron for organizing and directing the work of the pupils. The school in its educational functions was independent of the hospital, though the students were subordinate to hospital régime, in so far as work was concerned. The theoretical teaching was by means of lectures, prescribed reading, and written reports. The actual instruction in the beginning covered but one year. It was the idea of the school to prepare women to carry this system of organization and training out into other hospitals and infirmaries, to become, as it were, pioneers and reformers, and this plan has been faithfully carried out. Preparation for private nursing was not included in the original plan, but nursing in the homes of the poor was definitely provided for. The Nightingale system, as it was called, spread quickly into the hospitals of the United Kingdom, and later found its way into various European countries. The introduction into the hospitals of a body of refined and educated women as workers and students brought about in them a striking transformation, a "moral renovation" as one writer called it. The lessening of the mortality rate, the rapid advance of educational and scientific work and experiment in medicine and surgery, the rising confidence of the public, are unquestionably due largely to the coöperation with the physician of the scientifically educated modern nurse.

American Advance. — In America the first attempt to provide instruction for hospital attendants was made by Dr. Valentine Seaman, a medical officer of the New York Hospital, who in 1789 established there a course of lectures in connection with the Maternity Department. Other efforts were made by the Society of Friends in Philadelphia in 1839, and by the Woman's Hospital in 1861, while in 1862 the Hospital for Women and Children in Roxbury, Mass., opened a school offering a year of practice and training in the hospital with a course of lectures from physicians, to which outsiders were admitted. This school is still in existence and has done good work.

In 1873 three important training schools were established in this country, all influenced directly or indirectly by Miss Nightingale's teaching and system. These were the schools connected with Bellevue Hospital, New York, the Connecticut Training School, New Haven, and the Massachusetts General Hospital at Boston. They were established by committees or bodies, usually of women, who undertook to provide suitable quarters for a group of students, and to pay for theoretical instruction, seeking only opportunity for practical instruction and training in the hospital. In each instance, as in the establishment of the Nightingale School, there was some opposition from medical men, who, whether satisfied or not with the existing conditions, were unwilling to accept the idea of educated women assisting them in the care and treatment of the sick. The students paid nothing for instruction or for living expenses, the school supplying one and the hospital the other in return for services rendered. Usually also the hospital paid a small allowance monthly to the students, designed to meet the expenses of uniforms, textbooks, etc. The training covered one year and the students were sent out into families during the second year, ostensibly for practice and experience in private nursing, but in reality to bring in, through payment for their services, additional funds for the maintenance of the school or hospital. At the end of two years of successful work a certificate was given.

The effect of the training school upon the hospital was as markedly beneficial in this country as in England, and shortly hospitals grasped the economic significance of the system, and began to establish schools of their own.

Medicine and surgery were making rapid progress and bringing about a great expansion in hospital buildings and work. Public charity and philanthropy was expressing itself in more and better hospital facilities, and more and more were these institutions leaning upon the training school. The rapid growth in training schools during the last three decades is shown in the statistics of the Bureau of Education for 1911. These show: in 1880, 15 schools; in 1890, 35 schools. Statistics secured by Mr. Sutton and published in his Hospital and Training School Directory in 1910 show over 1300 training schools in this country at that date. There are said to be about 30,000 students in the training schools of the country at this date (1913).

These schools are almost universally owned and managed by hospitals, whether these institutions are state, municipal, endowed, or private and special corporations. The responsibility of the school is readily assumed by hospital authorities for the following direct and definite reasons, and others more or less subtle and indirect: first, the obvious economy of carrying on a large, essential, and highly important department through a staff of student workers; second, the fact that through such a body under a proper system of organization, instruction, and supervision an efficient and stable system of nursing is insured; third, the ease, if educational standards are not rigidly enforced, of securing a sufficient number of student workers; fourth, the intangible but valuable asset of the spirit prevailing in an institution where the workers are all seekers after knowledge and skill. Under this system the school has become to all intents the entire working staff of the hospital, economic and other considerations pushing its members, while still students, upward into the responsibilities of official positions and downward into the performance of unskilled domestic duties. The need in all hospitals for continuous twenty-four hour service, the constant improvement in methods and elaboration of details, the very nature of the work, all have called for a comparatively large staff of workers; but hospital limitations in resources have kept the numbers of the students restricted. The hours of work consequently have been long, and students thus unable to profit fully even by such limited theoretical instruction as has been offered. Such conditions have made the development of a sound and progressive educational system extremely difficult, yet progress has been made, and many radical changes have been introduced during the last fifteen years. The course of instruction has advanced from two years to three; there has been marked improvement in actual teaching, in character, extent, methods; new subjects have been introduced and old subjects more thoroughly taught; clinical teaching and supervision of students' work in wards is vastly better than it was even ten years ago. Libraries, teaching facilities, are appearing, and during the last five years a demand for trained teachers has arisen. About ten years ago preparatory courses were introduced into a few leading training schools, with the intent of giving the students the larger part of their groundwork in science before permitting them to begin practical work in the hospital. These courses have proved valuable, and are now established in eighty-six schools, chiefly the leading schools in the country. The time devoted to this scientific instruction is six months in some schools, but ordinarily does not exceed three months, in which the student will perhaps receive all the instruction in fundamental sciences of anatomy, physiology, bacteriology, chemistry, which the school can give her. It is a movement in the right direction, but a longer period should be encouraged. There are promising indications of progress in a few schools which have established relationships with universities or colleges, thus securing there the required scientific groundwork for their students. Typical instances of this affiliation may be found in the Northwestern University, Chicago, which provides teaching in fundamental sciences for three training schools, and in Simmons College, which has for years been affiliated with certain Boston training schools. There are also a few training schools having direct connection with universities through the medical schools of which they form a sort of sub-department. Advantages of many kinds arise from this connection, and as there are now fourteen schools related to universities on some such basis, there is good reason for assuming that extensions in this direction may be looked for. The training school recently established in the University of Minnesota is an interesting and important instance of this tendency. Much of such educational progress as has been made is due to the efforts of a few leading women in the profession. The most noted and able of these was Isabel Hampton Robb, the first superintendent of nurses and principal of the Training School connected with the Johns Hopkins Hospital, Baltimore, — a woman of exceptional power, initiative, and organizing ability. Under her régime many important advances were made in nursing.

There are aspects of the work, however, in which little progress has been made. The hours of practical work still remain excessively long. In nearly 50 per cent of all schools the students still work ten hours daily, and twelve hours at night. The eight-hour day established in some hospitals many years ago has not made great headway, and a full eight-hour system is found only in four schools in the country, though sixty-nine in all have introduced a partial system which provides eight hours by day, and ten or twelve by night. It is of course manifestly impossible to develop any sound system of instruction until the hours of practical work can be greatly reduced, and from the standpoint of the patients, of stability in hospital service, of expense, this will be difficult to accomplish. In all schools the time devoted to theory is meager, the maximum time throughout the three years not exceeding three hours weekly. Emphasis is, at all times, laid strongly upon the practical, and the true relation of theory to practice, of thought to action, is but dimly apprehended.

Professional Associations. — Educational progress has been greatly stimulated by and indeed it may almost be said to date from the organization of nurses into alumnæ associations, state and national. The Society of Superintendents of Training Schools for Nurses formed in 1893 has rendered steady and valuable services in the improvement of hospital and training school work. Through its efforts courses were established at Teachers College in 1899 to prepare graduate nurses for supervision and teaching in training schools. Recently this has been developed by endowment into a department in which the original plan has been carried further, and preparation offered in sanitary and social science for public health workers. This society also brought into existence the Associated Alumnae of Training Schools which has recently become the American Nurses' Association. Both have been vigorous and active in securing legislation, in supporting professional journals, in urging forward and strengthening good educational and professional standards, training, and ideals. In any criticism of the weakness of the modern training school, the strong features of its work must not be overlooked or minimized. The student's actual theoretical teaching may seem weak, but the lecture and classroom have a comparatively small place in her training. Clinical bedside instruction, daily work under the constant supervision and criticism of expert workers, rich opportunities for study and observation, close daily association in work with medical and surgical experts and specialists, are the main and most important educational factors.

The Present Situation. — Beyond this the moral and ethical demands upon the student, inherent in the very nature of her work, are such as to form an educational influence of a very high order, and to develop a personal discipline and a sense of responsibility of distinct social value. The work of nursing is rooted deeply in vital human needs. It has, and has always had, an extraordinary appeal to many women. For years, while few occupations besides teaching and nursing were open to women, there were a great many applicants to training schools. The early schools attracted many women of excellent education, much ability, altruistic leanings, courage, spirit, and devotion. The opening up of many new opportunities for women has drawn from the large number of candidates formerly available, and the long hours of work, meager educational advantages, and other conditions have made nursing, or rather the training process, seem unattractive to the ordinary intelligent women of the day. There is now serious difficulty in securing enough students to maintain the system without so lowering or disregarding educational standards, as to imperil the welfare of the sick and the status of the profession. Those schools offering the best and soundest educational work, shorter hours for students and good living conditions, attract a reasonable number of satisfactory candidates. But no school can be assured of a student body of desirable caliber large enough to staff the entire hospital. The moment hospital requirements become the main or ruling factor in the selection and admission of students, standards of education or of personal fitness cannot be maintained, and standards and character of work in both school and hospital must eventually deteriorate.

Two forces are now at work which are beginning to influence training schools appreciably. The first is found in the legislation, providing for state registration of nurses, which has now been secured in thirty-four states, largely by associations of nurses. While most of these laws are permissive only (but seven are mandatory), they have set up definite, if moderate, educational and other standards, and have accomplished genuine improvements in hospital and training school work.

The other factor affecting educational methods is the passing of the nurse from the actual care of the sick in hospitals, and homes, over into the field of public health work. Preventive work for the protection of infant life, of the health of the school child, of the health of the young industrial worker in factory or shop, and in relation to tuberculosis, is largely relegated to the nurse as the logical person to apply directly the teachings of sanitary and medical science. Health nursing of which Florence Nightingale wrote nearly half a century ago is now beginning to take shape, and as educational propaganda form an essential factor in such work the nurse must be so educated and trained as to be able to meet this new requirement. There are nearly a thousand associations, large and small, in which nurses are engaged in public health work.

A new and important demand is made upon the hospital training school which must eventually be met either by it or by other institutions of another type. Already such efforts are projected. Since, however, there are already the elements of a practically perfect system existing in the modern hospital and training school, it would seem better to make such changes in the relationship between them, such reshaping and reconstruction, as will provide autonomy for the training school. Such changes, partly governmental, partly economic, would enable the school to fulfill adequately its essential functions, and to serve its full purpose in the community. On any other basis than this it is almost certain to degenerate.

Other Countries. — The general situation as regards nursing in other countries may be briefly summed up as follows: —

In Australia the nursing profession is highly organized, and works in close coöperation with medical men. Educational and professional questions are prominent and given first importance. A system of voluntary minimum requirement and examination has been universal and effective because state subsidies of hospitals enable governments to make conditions, and the National Association of Nurses, in which doctors are included, has been able to get government endorsement of standards. The minimum is three years in general work, — special studies and special examinations for intending superintendents of hospitals and training schools. State registration and examination has just, during the current year, become law in Queensland. Very similar conditions exist concerning nurses in New Zealand, except that it has had state registration and examination under national law since 1901, with excellent results. The course of training covers three years.

In Japan, training for nurses under the Red Cross is highly perfected. The training of nurses is, however, carried on under a paternal system and nurses have little voice or direction in the development of their own standards. Patriotism and self-sacrifice are the leading motives among Japanese nurses, but they are also very markedly efficient in details of practical work. The course covers three years. City hospitals have training schools but not of the same standards as the Red Cross.

In India there is a vast movement to obtain a minimum of practical and theoretical work in training native women. At present there are great variations and very little uniformity in efforts. Mission schools exist with a very weak and inadequate curriculum. A few hospitals are established on the best English models. Complications of language add to the difficulties of the work, but associations of superintendents and alumnae, made up, however, almost entirely of English and American nurses, are at work upon the nursing problem.

In China an excellent attempt at hospital and training school work has been recently initiated under the auspices of the Chinese government with a medical woman in charge of the hospital and an English trained nurse as head of the school.

In Italy pioneer work has been done for some years in Naples, Florence, and Rome by English and American nurses. Their work has brought about modern training schools in connection with several hospitals, more recently the Polyclinico in Rome under the protection of Queen Helen. This has a modern system and a three years' course, and has a promising future.

In France there has for some years been a state of unrest in hospital and nursing fields, owing to the secular strife which removed nuns from hospitals under government control and brought about a crude process of laicisation, largely with untrained women. The Nightingale system of nursing was introduced into two Bordeaux hosiptals by Dr. Anna Hamilton, and an admirable and thorough educational system has been established. The French government is now entirely committed to the principle of education for nurses and a new school of nursing was established under the city administration in Paris in 1907, in connection with the Salpêtrière and on a sound educational basis.

In Germany the general high state of cultivation by the government of technical and advanced education has not been extended to nursing, the reason perhaps being that it was long left to religious bodies to perform as unpaid labor of self-sacrifice and humble devotion. German nurses are now demanding three years of training and systematic teaching. The government has enacted permissive state examinations and registration with a minimum term of one year of training. A strong organization of nurses in Germany has given strength to the nursing movement, and it is seeking alliance with the woman's movement to demand higher conditions of labor and better instruction.

In Belgium a very elementary state registration act has been in force for several years. The early stage of transition from nursing by religious orders to the modern system is clearly seen here. Brussels city administration has founded a training school on the plan of the Paris school.

In Holland there appears to be complete indifference to the educational demands of nurses on the part of state authorities and a striking contrast is here shown to the desire of the French government to educate. Holland public men are satisfied with public school grade (at twelve years) for nurses, and the outlook for better standards is small at present.

In Scandinavian countries there is a general three years' course which is not well balanced. Educational requirements for pupils are generally high and the training excellent, although a number of subjects must be taken as specialities, thus making five or six years of study and training necessary.

In Great Britain, notwithstanding the fact that the modern system of training was developed in England, that district nursing and school nursing both originated there, it has been impossible up to the present to establish definite standards of education and registration for nurses. Every hospital is a law unto itself. Hospital directors resist the movement for registration urged by nurses, and show a general public unwillingness to regard nursing as an educational question. Three years' training is general. There is little theory, but high standards of practical work. From the very beginning many women of especially high educational and personal qualities have been drawn into nursing ranks. The movement for legislation concerning nurses and registration has been on foot in England since 1888. M. A. N.

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NUTRITION. — See Food and Feeding of School Children.

NYMPHOMANIA. — Abnormally great and uncontrollable desire for sexual excitement and gratification. The term is applied to woman, and the term satyriasis to man. Both differ from erotomania in that the latter is largely mental, the physical gratification being mainly replaced by ideas of love and of sexual matters in modified forms. These conditions are often found in children, especially in the feeble-minded. S. I. F.

See Sexual Anomalies.

OAKES, URIAH (1632-1681). — Fourth president of Harvard College; was graduated from Harvard in 1649. While a student at Cambridge he invented a set of astronomical calculations. After graduation he went to England and was pastor at Titchfield in Hampshire. He was silenced " with the other nonconforming ministers " and returned to America and was president of Harvard College from 1675 to 1681. In the opinion of Dr. Mather, America never had " a greater master of the true, pure Ciceronian Latin."

W. S. M.

OATHS OF TEACHERS. — See NEVADA.

OBERLIN COLLEGE, OBERLIN, O. — A coeducational institution founded in 1833 by two home missionaries, natives of Vermont, Reverend John J. Shipherd and Mr. Philo P. Stewart, and named after the devoted and far-sighted Alsatian pastor and philanthropist, Jean Frederic Oberlin (*q.v.*). The founders hoped to establish a community and educational center that might do in the Mississippi Valley work something like that accomplished by Oberlin in Steinthal. There was no definite attempt to be revolutionary, except in the Christian standards of the community established. But in the outcome, the institution did prove a pioneer in various directions. Full college education was opened to women, college coeducation of the sexes adopted, race barriers thrown down in the decision of the trustees in 1835 to admit students " irrespective of color," and the community became a center of anti-slavery and missionary agitation. Work in the preparatory department of the College began in 1833, and in the College department in 1834. The theological department was instituted in 1835, under the leadership of Reverend Charles G. Finney, the theologian and evangelist. The early teachers were largely from New England, and the college standards adopted from the first were those of the best New England colleges. Four young women were enrolled as freshmen in the regular college course in 1837; three of these were graduated in August, 1841, and are supposed to have been the first women to receive degrees in the Arts under the standards prevailing in the best men's colleges of the day. The Oberlin Conservatory of Music was organized as a department of the college in 1867. The College now regularly gives the degrees of A.B., Mus. B., A.M., and B.D. The entrance requirements for admission to the College of Arts and Sciences are fifteen units. The same requirements are now made for admission to the Conservatory of Music. Candidates for the degree of B.D. in the Theological Seminary must have the rank of college graduates. Oberlin is on the original list of accepted colleges of the Carnegie Foundation for the Advancement of Teaching.

The College has always had a self-perpetuating Board of Trustees, without denominational tests of any kind. Since 1890 the Alumni have elected one fourth of the Board by direct vote. There are at present seventy-five professors and associate professors, and sixty-eight other teachers and officers. For the year 1911-1912, there were enrolled in all departments 1780 students (all but 300 of college rank, and 998 in the College Department itself) from forty-five states and sixteen foreign countries; more than one half from outside Ohio. The alumni list numbers 6691; and the total number of students who have studied in Oberlin College since 1833 is 38,133. The college library contains 120,000 bound volumes, and about the same number of unbound volumes and pamphlets. The productive endowment of the college (March 1, 1912), is $2,207,046.32, and the value of buildings (twenty-two), grounds, and equipment, is $1,634,338.14. The total assets of the college amount to more than $4,000,000. The entire annual income of the institution from endowment and term bills for the year 1910-1911 was $386,735.50.

H. C. K.

OBERLIN, JEAN FREDERIC (1740-1826). — Philanthropist and educator, was for nearly sixty years pastor of the Ban de la Roche (Steinthal), a big and sterile district, some thirty miles southwest of Strassburg. His heroic and successful efforts to civilize a people suffering from the ravages of war and lapsing towards barbarism attracted the attention of Europe. He had roads constructed and better houses built; he taught improved methods of farming and introduced fresh industries; but his most fruitful work was the education of the young and his most novel device the establishment of infant schools. These were directed by motherly women, one of whom, Louise Schepler, was awarded a Monthyon *grand prix de vertu* and is described on her tombstone as "*fidèle servante et collaboratrice de Papa Oberlin . . . conductrice de la jeunesse.*" The aims of the infant schools were rooting out bad and forming good habits; inculcating the first notions of morality and religion; teaching the elements of reading, writing, and arithmetic; and eliminating the use of patois. The little ones were assembled in spacious rooms. The youngest played together while the rest were learning to spin, to knit, and to sew. Natural history and scripture were taught by pictures. In fine weather the *conductrices* took their charges for walks and made them find the flowers which had been described to them. These became the subjects of familiar talks and a desire to grow them was created.

In 1801 Mme. de Pastoret, inspired by Oberlin's example, established in Paris a *salle d'hospitalité*, but it was more a crèche than an infant school and does not appear to have lasted very long. D. S–N.

See INFANT SCHOOLS.

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OBERREALSCHULE. — The upper scientific school in the Secondary School System of Germany.

See GERMANY, EDUCATION IN.

OBJECT AND SUBJECT. — The older classic use of the terms subject and object was the opposite of that current to-day. According to the Aristotelian logic only substances, things existing as individuals not as qualities or properties of things, could be subjects of propositions and the subject matter of adequate knowledge. Subject and substance were thus practically identified; some trace of this meaning remains in the current use of the term subject matter. Scholastic philosophy, under the influence of Arabian thought, introduced the term "object" to designate things in their "second intention," that is, not as things on their own account, but as objects of thought or mental consideration. A chimera would thus exist objectively but not as a subject; according to the opponents of Platonic realism, universals (man, as distinguished from individual men) also had existence only objectively. Modern philosophy effected a complete reversal of this usage. The tendency began with the introduction of the psychological mode of thinking of Locke and his successors, and was practically completed by Kant. As the function of the self as the center of thinking, feeling, knowing, was insisted upon, the term subject was more and more used as a synonym for ego, mind, self, and the adjective subjective to denote mental existences. The problem of the relation of subject and object came to mean the problem of relation of mind and the world, especially as they enter into the constitution of knowledge. By the transcendental idealistic school much was made of the fact that the thinking ego is at once subject-object, since the thinking self is capable of presenting itself to itself as object. In self-consciousness, as thus defined, was found the key to the problem of the relation of particular minds or sentient subjects to the world, — a conception that had a great vogue in post-Kantian idealism. J. D.

See EPISTEMOLOGY; METHOD; SELF.

OBJECT TEACHING. — Object teaching was not, as the term may seem to imply, a mere method of imparting knowledge through the means of objects themselves, but a complete scheme of elementary instruction. It may be said to be an application of the inductive method to the teaching of children. Its aim was to begin with the training of the senses and proceed from this to the development of the entire nature of the child. The chief laws of its method were: (1) instruction by actual inspection; (2) go from the easy to the difficult; (3) give in each hour, if possible, a little whole in contents and form; (4) use conversation. All the great thinkers and educators from Luther on, Rabelais, Francis Bacon, Comenius, Locke, Rousseau, and the rest, forecast the principles which were developed by subsequent effort into object teaching.

Comenius (1592–1670) was probably the first definitely to formulate the principles of object teaching and to work out a graduated system of instruction applying the inductive method to schoolroom procedure. "Since the beginning of knowledge must be with the senses," he says, "the beginning of teaching should be made by dealing with actual things. The object must be a real, useful thing, capable of making an impression upon the senses. To this end it must be brought into communication with them: if visible, with the eyes; if audible, with the ears; if tangible, with the touch; if odorous, with the nose; if sapid, with the taste. First the presentation of the thing itself, and the real intuition of it, then the real explanation for the further elucidation of it." (*The Great Didactic*, Ch. XX, § 5–7.) But inasmuch as the presentation of the thing itself is so frequently impossible, he advised the use of pictures as the representations of things, that the words which related to them might be understood. He prepared and published textbooks, putting his theories into practice. These books were translated into various languages and were used for many generations wherever there were schools for children. The best known of these is the *Orbis Pictus*, or the *World in Pictures*. (See COMENIUS.)

After Comenius, Rousseau (1712–1778) is worthy of special mention as having been the first to base his educational theories on the child to be educated. The child's experience, accordingly, the facts of nature round about him, is to furnish the material for education. "In general, never substitute the sign for the thing itself, save when it is impossible to show the thing; for the sign absorbs the attention of the child and makes him forget the thing represented." (*Émile*, Book III.) It was as a result of acquaintance with *Émile* that Pestalozzi first conceived the idea which he subsequently expanded into the system of which he is worthily entitled to be called the father. (See ROUSSEAU.)

Pestalozzi (1746–1826) did the most, not only to formulate object teaching, but also to put it on a scientific, philosophic basis. "The most essential point from which I start is this: Sense impression (ANSCHAUUNGSUNTERRICHT) of nature is the only true foundation of human instruction because it is the only true foundation of human knowledge. All that follows is the result of this sense impression and the process of abstraction from it." (*The Method*, translated by Lucy Holland and Frances Turner and edited by Ebenezer Cooke, second edition, p. 316.) "The means by which a man whose mind is cultivated makes clear to himself all knowledge gained by sense impression come from number, form, and language. The instruction of children therefore should proceed from these three elemental points: (1) to teach them to look upon every object that is brought before them as a unit,—that is, as separated from those with which it seems connected; (2) to teach them the form of every object,—that is, its size and proportions; (3) as soon as possible to make them acquainted with all the words and names descriptive of objects known to them." (*How Gertrude teaches her Children*, translated by Lucy Holland and Frances Turner and edited by Ebenezer Cooke, second edition, p. 145.) According to these principles Pestalozzi divided his object lessons into three classes: (1) those on number; (2) on form; (3) on speech. Those on number were mainly lessons in mental arithmetic; those on form comprised geometry, drawing, and writing; those on speech included instruction in speaking and singing tones, instruction in words, or the means of becoming acquainted with single objects, and instruction in language itself, or the means of expressing one's self clearly, not only upon number and form, but also upon all other qualities of things, as well those qualities which are perceived through the five senses, as those which are perceived, not by means of a single intuition of them, but by means of our faculties of imagination and judgement." Thus the lessons on speech became the basis for instruction not only in spelling, reading, and language, but in geography, history, and natural history as well. It is not within the purpose of this article to criticize. It is well known, however, that in developing these principles Pestalozzi failed to observe the order in which he first formulated them. In his books, instead of providing for beginning with the object itself and calling attention to its identity and form, he began with words about objects and not even about objects to be under observation at the time, but about objects remote and incapable of being brought within the view of the child. In his schoolroom practice his impatience impelled him continually to prompt the pupil in both the idea and the expression of it, so that he often omitted altogether the first two elemental points of instruction and allowed the third to degenerate into an exercise in mere words. His so-called object lessons were not object lessons in fact, and were not even lessons in language. (See PESTALOZZI.)

In Germany Pestalozzi's disciples caught the spirit of his method. Taking his philosophic principles rather than his exposition of practice of them as a basis, they adapted them to their own needs and wrought out a system of their own; whereas Pestalozzi set up the human body as the nearest and ever present object lesson to the child, they proceeded in a more natural manner and struck out the following sequence: schoolroom, family, house, house floor, the sitting room, the kitchen, the ground, the cellar, the yard, the habitation, the city, the village, the garden, the field, the meadow, the wood, the water, the atmosphere, the sky, the season, the year and its festivals, man, body and soul — God. Or again, Diesterweg (1790–1866) finds seven different kinds of intuitions to be awakened: sensuous, mathematical, moral, religious, æsthetic, purely human, and social. Others were still more independent in working out and applying the Pestalozzian theory. Early in the last half of the nineteenth century object teaching had become established in the majority of the elementary schools of Germany. This had not been accomplished without serious opposition. The famous Prussian Regulation of October 3, 1854, spoke plainly on this subject. In 1872, however, a committee appointed by the Congress of Elementary Teachers meeting in Berlin submitted to Dr. Falk, the Minister of Ecclesiastical Affairs and Education, a set of resolutions or requests among which was one recognizing the importance of object teaching and asking for the organization of training schools in accordance with the pedagogic principles of Pestalozzi. For half a century before this time the question of object teaching had been engaging the best efforts of the leading educators in Germany. Among the many books on the subject may be mentioned those of Plamann, Denzel, Harnisch, Diesterweg, and Carl Richter (*q.v.*).

In France Pestalozzi and his methods were repudiated by Napoleon and were given no countenance in the schools during his time. From the downfall of Napoleon to the Franco-Prussian War the value of the labors of Pestalozzi was recognized by the leading educators of France, and his methods were in some instances put into practice. Jullien and Chavannes both placed their children under Pestalozzi's tuition and endeavored in various ways to arouse interest in Pestalozzi's work. Maine de Biran (*q.v.*) opened a Pestalozzian school at Bergerac in 1808, which continued in existence for nearly seventy years. Object teaching was not adopted as a system in the schools of France nor put into general use in any way prior to the Franco-Prussian War. After the close of this war a new impetus was given to the Pestalozzian movement. At the exhibition of 1878 a conference of the teachers of France considered the question of sense-impression teaching, which resulted in placing it on such a firm basis that it was generally introduced into all the elementary schools.

In England the object lesson as a separate branch of study was first given prominence. Charles Mayo (*q.v.*), who had spent almost a year in Pestalozzi's School at Yverdun, and his sister, Elizabeth Mayo, through the Home and Colonial Training School at Gray's Inn Road, London, attempted to reduce the Pestalozzian principles and methods to a practicable shape by the preparation of graduated courses of instruction. Manuals about objects and lessons on those objects to be learned and recited to the teachers were the ultimate result of the attempt of Charles Mayo " to preserve the Idea but adapt the Form " to those circumstances in which he might be placed. (See INFANT SCHOOLS; HOME AND COLONIAL INFANT SCHOOL SOCIETY.)

In America object teaching was employed in the various Pestalozzian schools of Joseph Neef (*q.v.*) in Philadelphia in 1809, in Village Green, Pa., in 1813, in Louisville, in 1816, and in New Harmony, Ind., in 1825. The Westfield Normal School (established at Barr, Mass., in 1839, removed to Westfield, Mass., in 1844) was the pioneer in introducing object teaching into the public schools. This school was also the first to show that all branches of learning may be taught by the same objective method. Object teaching at Westfield, however, attracted little general attention. It was left to the Normal School at Oswego, New York, to become the center of object teaching in America. In 1860 Edward A. Sheldon (*q.v.*) while on a visit to Toronto saw in the National (Educational) Museum there collections of the pictures, models, objects, and appliances used by the Home and Colonial School Society in England. The schools of Oswego had been developed out of his philanthropic activities; it was in the interest of these schools that he visited Toronto, and on his return to Oswego he at once began the reorganization of the schools there with special reference to object teaching. He was well fitted to make this adaptation by his previous thinking along the same lines and by his own earnest and partially successful efforts to make practical the education of the poor. In 1861 Miss M. E. M. Jones formerly connected with the Home and Colonial Training School, above referred to, came to Oswego as a training teacher and further elaborated the principles of object teaching. She was succeeded in the following year by Hermann Krüsi, Jr. (*q.v.*). The system became thoroughly established at Oswego. Mr. Sheldon and the other authorities at Oswego stood firm against the hostility aroused by their new methods. At their invitation in 1862, a committee of the leading educators of the country investigated the nature of the new work. Subsequently, as a result of a paper read by Mr. Sheldon before the National Teachers' Association held at Chicago in 1863, that association appointed a committee to look into and report upon the principles of object teaching. This committee reported at the meeting of the association held at Harrisburg in 1865. With only one dissenting voice the report was heartily in favor of the adoption of object teaching in the elementary department of the public schools. The Oswego Normal School continued to be the center of influence for object teaching until its principles and methods became fused with those of the nature-study movement. In 1876 Professor H. H. Straight, a disciple of Agassiz and Shaler, went to Oswego. His views of science teaching in the elementary school underwent gradual but decided change under the Pestalozzian influence in which he was placed, and the object lesson of Oswego was modified in turn by Professor Straight, who recognized the need of system and correlation. William T. Harris (*q.v.*), inspired by Pestalozzian principles, worked out a method for the teaching of natural science. The study of natural science was introduced not only into all grades of the elementary schools of St. Louis, but through the direct and indirect influence of Dr. Harris, it became incorporated, in one form or another, into the curricula of most of the common schools of the United States. So that it is reasonably certain that nature study at least in spirit is the direct descendant of object teaching. It may safely be asserted that, not only in America but in all other advanced countries as well, most of the accredited methods of elementary instruction now in use, can be traced more or less directly to the principles of object teaching. E. R.

See OBJECTIVE METHOD; CONCRETE AND ABSTRACT; REALISM IN EDUCATION; etc.

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OBJECTIVE METHOD. — The use of concrete experiences, of sense perceptions, as a basis for teaching ideas, concepts, relations, etc., and for giving the meaning of language symbols, is termed an objective method of instruction. It assumes a wide variety of forms. When first introduced into the elementary classroom, it implied the bringing of objects into the classroom; later it included school excursions, where pupils leave the schoolroom to make observations of natural and institutional facts. Laboratory teaching is a form of objective work. The action work employed by primary children in acting out the meaning of sentences read by them, and the more complicated children's dramatizations of literature are derived modes of objectification which aid in giving clear sense impressions. Such visual aids as pictures, graphs, and maps are likewise objective inasmuch as they are pictorial substitutes for real objects.

Prior to the second quarter of the nineteenth century there was little object teaching. The use of objects in giving a concrete basis for abstract notions seems to have gained its initial hold on the schools through the introduction of Pestalozzian methods of teaching. The introduction of school subjects requiring objective treatment, such as elementary science, nature study, and manual training, fortified the previous movement and gave it considerable extension. Together these two movements established the respectability of objective teaching. Schoolroom experience quickly gave it an empirical sanction. It remained for the modern psychological movement in education to give it a scientific sanction and to refine its uses.

It is quite fair to say that the use of objective work decreases more or less gradually from the first to the last year, the underlying assumption being that the use of objects has a teaching value that decreases as the maturity of the pupils increases. Current practice does not proceed far beyond the application of the simple and somewhat crude psychological statement that the youngest children must have much objective teaching, the older less, the oldest least of all. The lack of a more refined analysis of the worth of object teaching necessarily leads to some neglect and waste. Examples from the teaching of arithmetic, where objective teaching has been a matter of greatest controversy, will indicate the status of objective teaching in general. If a topic occurs late in the course of study, as in the case of square root, the subject is not so well taught because of the current prejudice or tradition against the use of object teaching in the higher grades. On the other hand, it is also probable that the teaching of addition is often accompanied by wasted time and energy simply because lingering over objects in the lower classes is the current fashion. Reform in the direction of a more refined and exact use of object teaching is suggested by the extended objective treatment of fractions and mensuration, which partially disregards the increased maturity of the children studying these topics. This is a considerable departure from the slight objective treatment of other arithmetical topics taught in the same grades. Such exceptional practices suggest that the novelty of a topic is the condition calling for objective work in instruction. It is immaturity in a special subject or situation which determines the amount of basal objective work required. The correlation is not with the age of the pupil, but with his experience with the special problem or subject in hand. It is of course true that the less experienced the student is, the greater the likelihood that any subject presented will be novel and strange. Only in this indirect manner does the novelty of subject matter coincide with mere youth as an essential principle in determining the need of objective presentation. The naïve assumption of the older enthusiastic reformers that objective work is a good thing psychologically, one of which the pupil cannot have too much, is by no means the accepted view of the modern educator. With the latter, objective presentation is an excellent method at a given stage of immaturity in the special topic involved, but it may be uneconomical, even an obstacle to efficiency, if pushed beyond.

There is, then, a certain coincidence of the psychologist's scientific criticism and the conservative teachers' common-sense criticism when both look suspiciously upon a highly extended object teaching. The teacher, on grounds of experience, says that too much objective teaching is confusing and delays teaching. The psychological critic says it is unnecessary and wasteful. The result is that the distribution of objective work has somewhat changed of late. More subjects are developed in the higher grades through an objective instruction than before. Perhaps no fewer subjects in the lower grades are presented objectively, but the extent of objective treatment of each of these has undergone considerable curtailment.

The existing defects in objective teaching are not restricted to a false placing or distribution. The quality of the teaching use of objects is likewise open to serious criticism. Object teaching is a device so successful, as against prior non-objective teaching, that it has come to be a standard of instruction as well as a means. As long as objects — any convenient objects — are used, the teaching is regarded as good. Given such a sanction, the inevitable result is an undiscriminating use of objects. The process of objectifying tends not to be regulated by the needs of the child's thinking life; it is determined by the enthusiasm of the teacher and the materials convenient for school use.

The first fact which is noted in estimating objective teaching is the artificiality of the materials employed. Primary children count, add, etc., with things they will never be concerned with in life. Lentils, sticks, tablets, and the like are the stock objective stuff of the schools, and to a considerable degree this will always be the case. Cheap and convenient material suitable for individual manipulation on the top of a school desk is not plentiful. But instances where better and more normal material has been used are frequent enough in the best schools to warrant the belief that more could be done in this direction in the average classroom. The "playing at store," the use of actual applications of the tables of weights and measures, are cases that might be cited.

The materials used are not only more artificial than they need be, but are too restricted in range. As has already been said, the types of material capable of convenient and efficient use in a schoolroom are not numerous. But the series can and ought to be extended. More forms of even the artificial material should be used, thus minimizing the danger of monotony. The blame for the narrow range of materials used falls partly on school boards who do not vote a sufficient allowance for teaching materials to primary teachers; partly on teachers who do not exercise sufficient ingenuity in devising new forms of objects or show the vigor requisite to a shift from one material to another; and partly on the supervisory staff which has neither been insistent upon nor sensitive to the need of a more interesting range of objective stuffs.

Even the narrow range of materials in general use might be better employed than it is. There is, of course, a distinct tendency to vary the object, merely because a child gets tired of it as a material. But a different quality of variation is required when the pupil is to derive abstract notions from concrete materials. It is too frequently the case that the teacher will treat the fundamental addition combinations with one set of objects, *e.g.* lentils. In all the child's objective experience within that field there are two persistent associations — "lentils" and "the relation of addition." The accidental element is thus emphasized as frequently as the essential one, and being concrete has even a better chance to impress itself. A wide variation in the objective material used would make teaching more effective, particularly with young children.

The nature of the materials proper to objective teaching has likewise been too narrowly interpreted. Objective teaching has meant, almost exclusively, instructing or developing through three-dimensional presentations. There is a wide range of two-dimensional representations, *i.e.* pictures, which have been neglected, which for all the psychological purposes of education have as much worth as so-called objects. Such quasi-objective material has been little used by teachers save as it appears in textbooks. Even the textbook writers have not used pictures with a deep sense of their intrinsic worth. They are printed as a mere substitute for objects in a period when objects are popular pedagogical materials. The geometric figure or diagram has had a restricted use with both the teacher and the textbook writer. Its most frequent use has been in treatments of mensuration. There are, of course, obvious disadvantages to pictures and diagrams. The things represented in them and by them are not capable of personal manipulation by the child in the ordinary sense. But they have a superiority all their own. They offer a wider, more natural, and more interesting range of concrete experience.

There are other curious phases of narrowness in the current pedagogical interpretation as to what constitutes a concrete or objective experience. It will be noted that visual objects are the ones generally employed and that they are generally inanimate objects. Of late there has been some tendency to use hearing and touch as a concrete basis to teaching. Advantage is also taken of the social plays of children, and their games with things. Here the children themselves, and their relations and acts, are the experiences from which abstract notions are obtained. With some of the best teachers in the lowest grades it is no longer unusual to see children moving about in all sorts of play designed to add reality to, and increase interest in, language and its concepts.

The conservative teacher's use of objects is artificial and lacking in unity. If he brings a series of objects into the development of a single topic, they have little relation to each other. They represent no actual grouping. Their sole connection with one another is that they exemplify the same abstract truth. Beans, cardboard squares, and shoe-pegs may all be employed in the same lesson. The progressive teacher offers more logical unity in their materials. To "play at store," to utilize games, to deal with things within a single picture, is to bring the concrete materials into the classroom with a more nearly normal setting. It is in no small measure due to this better use of material that the progressive teacher is gaining power throughout the elementary grades.

Inductive teaching has been one of several movements affecting objective teaching. The effort of teachers to escape the slavishness of mere memoriter methods and to approximate real thinking led to the introduction of inductive teaching. Necessarily objective teaching became more or less identified with the new movement and was influenced by it. So, it has been said of objective work in arithmetic, as it has been said of laboratory work in the sciences, that such instruction is a method of "discovery" or "rediscovery." Such an alliance has had its beneficial effects upon objective teaching; it has redeemed it from the aimless "observational work" of an earlier "objective study." But too frequently it confused an objective mode of presentation with a scientific method of learning truth, two activities having a common logical basis, but not at all the same. Under the assumption that the "development" method is one of "rediscovery," the tendency is to give the child as complete a range of concrete evidences as would be necessary on the part of the scientist in substantiating a new fact. The result is that long after the child is convinced of a truth the teacher persists in giving further objective illustrations of it. The child loses interest in the somewhat monotonous continuance of objective manipulations, and the teacher has naturally wasted time and energy. If the fact or the process that the teacher wishes to convey can be transmitted with fewer objective treatments (the authoritative treatment of the teacher counting for something in school as authority counts everywhere), then it is unnecessary to exhaust the objective treatments of a fact. Inductive teaching and learning are not equivalent to inductive discovery; and to hold them identical is necessarily the too great use of objects in teaching.

Another modern movement in teaching method which has had a conspicuous effect on objective teaching is the movement toward "self-activity" on the part of the child. The recent favor enjoyed by manual training, nature study, self-government, and other active phases of school life is an index of the general movement in mind. Its influence has not only forced the introduction of new subjects; it has changed the manner of presenting the older subjects of the elementary curriculum. Reading, language, spelling, and arithmetic have responded by incorporating an active use of objects by the children themselves. There was a time when objective work in the schools was a passive matter so far as the child was concerned. Any active manipulation of the objects that might be required was cared for by the teacher, the child being merely a passive observer. This is at present much less the case than formerly, the influence of " self-activity " having entered into contemporaneous pedagogy. The present situation is one where the child sometimes merely observes objects and sometimes actually handles them. At one extreme the teacher himself demonstrates in the presence of the class, and records the relations in appropriate symbols, the class being in the position of interested spectators of a process. At the other extreme the teacher puts the objective materials on the desks of the children and, with a minimum of instruction in advance, directs them towards the desired experiences and conclusions.

There is probably no single type of method which has been as influential for good in the schools as objective teaching. But the appropriate refined use of the varied forms requires an analysis and care which the average classroom practitioner has not given. More accurate interpretations and applications of the method are necessary. H. S.

See Excursions, School; Object Teaching.

OBLATES OF MARY IMMACULATE, THE. — See Teaching Orders of the Catholic Church.

OBSERVATION SCHOOLS. — Schools connected with institutions for the training of teachers where the prospective teacher observes practical work of instruction in connection with his theoretical training. The term is used to distinguish such an affiliated school from those where the prospective teacher is allowed trial teaching usually termed a Practice School (*q.v.*) or a Training School. It is also distinguished from closely related schools which may be termed Experimental Schools (*q.v.*), which are used for educational experimentation under expert direction. The term Observation Schools, however, is used synonymously with the term Model School (*q.v.*).

OBSERVATIONAL GEOMETRY. — See Geometry.

OBSERVATIONAL METHOD. — See Objective Method.

OBSESSION. — An impressive and persistent idea similar to a fixed idea, which holds the field of consciousness to the exclusion of normal ideas. The idea is of exaggerated importance and usually leads to certain abnormal actions. Although at times the ideas are understood by the individual to be abnormal, they cannot be restrained. Pathological action is not a necessary part of the obsession for many persistent ideas lead to no special action; any constant recurrence of one idea is properly called an obsession.

The commonest forms of obsession are fears relative to the performance of certain acts, or to the power or influence of certain conditions or things. The fear of walking under a ladder, of walking on the cracks of the sidewalk, of leaving a pin lying on the street, are examples of the commonest obsessions which, however, do not become pathological because of later education and of the demands of business or professional life. They may, however, lead to more marked abnormalities, such as the phobias (*q.v.*). The fear of open places (agoraphobia), the fear of closed places (claustrophobia), the fear of high places (acrophogia), the fear of fire (pyrophobia), are the most common of these.

Obsessions of doubt are also frequent. These are of having performed some action which should not have been performed, or not having done a thing or of having done it improperly, or of having given undue or improper credence to certain things, mainly religious. The so-called *delire de negation* may be considered an extreme example of this. The individual denies the existence of the world, the existence of his own body, and everything. This leads to delusions that he is unable to die and, if the emotional tone is depressed, he may believe that his sufferings are to continue throughout eternity. On account of the insistent idea the obsession eventually may lead to the committing of crimes, to certain genital acts, to scruples, to disjointed thought, and to hypochondriacal ideas resulting at times in suicide. Here also belong the so-called simple monomanias (*q.v.*). The kleptomaniac has an insistent idea, he is obsessed, he must take the article which is close at hand; the dipsomaniac cannot withstand his insistent idea, he cannot let an opportunity to take alcohol go by, even though he must steal a drink; the pyromaniac must start a fire, the impulse cannot be controlled. There are also the doubters (*folie du doute*), who are forever considering the possibilities and proprieties and the values of certain actions. At times these are simple, the doubt referring to simple acts such as having closed the safe, or locked the door, or that the clothing has been improperly buttoned or fastened. These doubts lead to the repetition of the action. The man returns to his shop and examines the safe again; the man and woman feels of the buttons or hooks to see that they are properly fastened. When doubts are exaggerated, they may lead to the performance of the same act dozens of times. The questionings and objections and doubts sometimes, because they cannot be answered, result in an aboulia, in which condition the individual does nothing because he cannot decide whether a certain action will give a proper result.

These conditions are found in psychasthenia (*q.v.*); neurasthenia (*q.v.*), hysteria (*q.v.*), and in other functional neuroses and psychoneuroses. A special pedagogical interest lies in the facts that they usually begin in childhood on account of some mental accident, and that they develop as time passes. The treatment of these cases can be carried out only when the cause or causes are discovered, and with these as a basis a reconstruction and reëducation or perfection of habit in the individual is brought about. Both etiology and treatment indicate fully the importance to the teacher of a knowledge of the condition.

S. I. F.

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OCCIDENTAL COLLEGE, LOS ANGELES, CAL. — A college established in 1887 by men of Presbyterian faith for the purpose of providing opportunity for Christian education for the young people of Southern California. Three years later, having absorbed McPherron Academy, it was incorporated under the laws of the State of California as Occidental College of Los Angeles. During the year 1911–1912 its enrollment numbered 300 and its teaching force twenty-two professors and instructors. The present campus, to which additional adjoining land has been added, contains twenty-five acres, and plant of three buildings, the old plant having been destroyed by fire in 1896. The college will move to a new site September, 1913. During the past five years the college has become non-denominational, and the academy has been discontinued.

A. G. P.

OCCOM, SAMSON (1732–1792). — American Indian educator. He belonged to the tribe of the Mohicans and was educated at Moor's Charity School at Lebanon, Ct., conducted by Eleazar Wheelock (*q.v.*). He taught at New London, Ct., and for ten years he conducted an Indian School on Long Island. In 1766 he was sent to England by Dr. Wheelock to solicit the funds which secured the establishment of Dartmouth College (*q.v.*). He was a minister of the Presbyterian church, and devoted the remainder of his life to religious and educational work among the Indians.

W. S. M.

OCCUPATIONS. — See ACTIVITY; INDUSTRIAL EDUCATION; KINDERGARTEN.

OCKHAM (OCCAM), WILLIAM OF. — See SCHOLASTICISM; SCHOOLMEN.

O'CREAT. — N. O'Creatus, as he describes himself, was a pupil of Adelard of Bath (*q.v.*), and to this scholar he dedicates one of his books, a work on multiplication and division: "N. O'Creati liber de multiplicatione et divisione numerorum ad Adelardum Bathoniensem magistrum suum." The preface to this work begins as follows: "Prologus N. Ocreati in Helceph ad Adelardum Betensen magistrum suum." The meaning of Helceph (Helcep, Ars Helcep) is unknown, although there are several conjectures, as that it is from the Arabic *alqeyf*, a study. The life of O'Creat is as unknown as the curious word that he uses, for we know nothing of his birth or death or works. He lived in the twelfth century, and was probably a teacher of some distinction, acquainted with Arabic as well as with Latin. The name seems to show that he came from Ireland, and it is possible that he learned Arabic from Adelard, who was a master of this language.

D. E. S.

ODESSA, ROYAL NEW RUSSIAN UNIVERSITY. — See RUSSIA, EDUCATION IN.

ODO, ST. — See CLUNY.

ODOR. — Odors are the stimuli for the sense of smell. The general assumption is that odorous substances give off small particles which are borne in the air to the olfactory membrane and there induce chemical changes in the nerve. What the chemical character is that serves to excite the nerve is not known, although there is some evidence that substances of similar chemical composition have similar odors. Practically all of the odorous substances belong in the fifth, sixth, and seventh groups in the periodic classification. Odors are all named from objects; there are no true names for odors.

W. B. P.

See Olfactory Sensations.

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OHIO NORTHERN UNIVERSITY, ADA, OHIO. — A coeducational institution established in 1871 as the Northwestern Ohio Normal School. In 1885 the name was changed to Ohio Normal University, and in 1898 this institution was sold to the Central Ohio Conference of the Methodist Episcopal Church, which obtained a new charter under the present title in 1904–1905. The following departments are maintained; commerce, engineering, law, liberal arts, music, pharmacy, normal school, fine arts, and expression. Fifteen units of high school work are required for admission to the college of liberal arts. The usual college degrees are given. The enrollment of students in 1911–1912 was 1869. There is a faculty of thirty-eight members.

OHIO, STATE OF. — Ceded by Virginia to the Federal Government in 1784, organized as a part of the Northwest Territory by the Ordinance of 1787, and admitted as the seventeenth state in 1802. It is located in the eastern part of the North Central Division, and has a land area of 40,740 square miles. In size, Ohio is about the same as Virginia, a little smaller than Pennsylvania, and about the size of England proper. For administrative purposes the state is divided into eighty-eight counties, and these in turn into townships, cities, incorporated towns, and special school districts. In 1910 Ohio had a total population of 4,767,121 and a density of population of 117 persons to the square mile.

Educational History. — The land ordinance of 1785, providing for the rectangular survey of lands in the Northwest Territory, in which "lot No. 16 in every township, for the maintenance of schools within the said township," was ordered to be reserved for sale, marks the beginning of educational legislation for Ohio. In the contract for the sales of tracts of land, made by the Continental Congress in 1787 with the Ohio Company, and in 1788 with John Symmes, lands for schools, religion, and a university were reserved and granted. (See NATIONAL GOVERNMENT AND EDUCATION.) In 1799 the Northwest Territorial legislature enacted a law against trespass on school lands, imposing a fine of $8 for any injury to certain specified trees, and $3 for injury to any unspecified tree. This was the only territorial legislation in Ohio having any reference to education.

On the admission of Ohio in 1802, in return for a tax exemption for five years on all national lands sold, Congress gave the sixteenth section in each township to the inhabitants thereof, for the benefit of schools, and the new state put into its state constitution three clauses relating to education and learning. These declared that religion, morality, and learning should be forever encouraged, guaranteed equal benefits to the poor in the schools supported from the land funds, and permitted the incorporation of societies and institutions for the support of schools and the advancement of learning. In 1802 the legislature created the University at Athens, and in 1809 Miami University (*q.v.*) was founded. In 1803 the legislature incorporated the Trustees of the Erie Literary Society, in 1805 the Trustees of the Dayton Library, and in 1808 the legislature granted incorporation to Academies at Chillicothe and Dayton. For the next nine years almost the only educational legislation was the chartering of such institutions, and in 1817 the necessity for these special acts was removed by the enactment of a general law for the incorporation of schools and library companies. The only other educational legislation up to 1821 was the enactment, in 1806 and 1810, of laws authorizing the organization of any school township having twenty voters, the election of three township trustees and a township treasurer to look after and care for the school sections, and further authorizing the trustees to divide the townships into such school districts as they might see fit, and to grant to any schools organized their share in the profits of the school land section. No other means of school support seems to have been provided before 1821.

The first public school law was enacted in 1821, but was so inadequate that the law of 1825 is usually regarded as the real beginning of the public school organization in Ohio. This ordered the trustees of the civil townships to organize school districts, retained most of the provisions of the Act of 1821 with reference to the duty of school officers, made the first provision for the certification of teachers, and levied a one half mill county school tax. The school revenues were still inadequate, and the rate bill was continued as before. The branches of study to be taught were reading, writing, and arithmetic. Three examiners of teachers were to be appointed by the county court of common pleas, who, in addition to examining teachers, were to visit and supervise the schools.

The year 1827 marks the establishment of the common school fund of the state. In 1824 Ohio petitioned Congress for permission to sell its school lands, which Congress granted in 1826. The law of 1827 authorized the sale, ordered the money to be placed in the State Treasury to the credit of the townships, and pledged the faith of the state to pay interest on the deposits at 6 per cent. In 1831 the salt lands, given to the state at the time of its admission to the Union, were also devoted to education. New general school laws were enacted in 1829, 1831, 1834, and 1836. Each was merely the combination of its predecessor with such minor amendments as had been enacted in the interval. In 1827 the minimum school tax on each householder was fixed at $1, though this might be paid by two days' labor on the schoolhouse, a provision which continued until 1838. In 1827, also, all fines for immoral conduct in any school district were to be paid over to the district school funds. In 1829 the first special city school law (see CINCINNATI) was enacted, negroes were debarred from school privileges, the county school tax was increased to three fourths mill, and school district meetings were more fully provided for. The provisions for voting school district taxes, and the exemptions, were somewhat minutely specified. A three months' school term and the first grading of teachers' certificates were also provided for. In 1831 the school district directors were constituted a body politic and corporate, a census of school children was provided for, the basis of apportionment was changed from householders to census children, and teachers' certificates were to be based on a knowledge of reading, writing, spelling, and arithmetic, with special certificates to women on reading, writing, and spelling only. In 1834 an assistant examiner of teachers for each township, to be appointed by the county board, was provided for. In 1833 and 1834 the fuel tax was provided for in the law, and school directors were authorized to furnish the quota of any one neglecting to do so, and to charge the same to the delinquent. In 1836 the county school tax was increased to one and one half mills, with permission either to county commissioners to levy two mills or to townships to levy an additional one and one half mills.

In 1829 there was organized at Cincinnati the Western Academic Institute and Board of Education, which in 1832 became the Western Literary Institute and College of Professional Teachers. For ten years this was almost the only strongly stimulating agency in education in the state. It sought to promote the diffusion of knowledge as to education, and to elevate the character and quality of the teachers of the state. Among its members were Albert Picket, Lyman Beecher, Samuel Lewis, B. O. Peers, and Professor Calvin E. Stowe. Money was subscribed, an agent was sent to visit the schools of the state, and delegations appeared before the legislature in the interests of education. Under the influence of this society, Professor Calvin E. Stowe was commissioned by the legislature to visit Europe and to report on the systems of elementary instruction found there, and 10,000 copies of his report were ordered to be printed by the legislature in January, 1838. In 1836 a state convention for promoting education was held, and in 1837 the legislature was prevailed upon to make the beginnings of state school supervision, by the creation of the office of Superintendent of Common Schools. The Superintendent was elected by the legislature for a one-year term, and was to receive a salary of $500. His duties were almost entirely statistical and clerical. Finally, in March, 1838, and largely as a culmination of these efforts, what has become known as the great school law of 1838 was enacted. This was based on the recommendations contained in the first report of the new Superintendent of Common Schools, and marked a great advance in school legislation for the state. It was based on the idea of strengthening the power of the state and of the townships at the expense of the districts. The office of State Superintendent of Common

Schools was continued, but changed to a three-year appointment, and the salary increased to $1200. A state common school fund was created, as distinct from the common school fund or township fund, established in 1827. In this new fund were placed the salt lands, devoted to education in 1831; interest at 5 per cent on the Surplus Revenue, distributed in 1837 (see NATIONAL GOVERNMENT AND EDUCATION); the state's revenue from banks, insurance, and bridge companies, and some other minor sources of income. The income on all of these items amounted to about $200,000 a year and this was to be distributed to the townships on the basis of the school census. A state school tax of one half mill was also voted a few days later, and the required county school tax was increased to two mills. For the townships, every township clerk was made *ex officio* township superintendent of schools with the usual supervisory duties. He was also to estimate the money needed to provide a six months' term of school, and to submit to the voters of the township the question of levying the tax. The township treasurer was also given the custody of all state, county, and township school funds, the district treasurers being left only the district taxes for building, fuel, and furniture. School directors, too, were given greater independence of action. They could now levy annually a tax of $20. for incidental expenses without the sanction of the district meeting, and the old limitation of district taxation to resident property holders was withdrawn. All voters were now admitted to the district meetings. School directors were authorized to determine at what ages children could be admitted to school, and to permit instruction in a foreign language (German). Cities and towns were declared separate school districts, wherein the electors were to choose either three directors for the whole city or town, or one for each subdistrict (school). Directors in cities and towns were empowered to establish schools of different grades, and to make rules and regulations for their management.

The law of 1838 was the first comprehensive school law for the state, and was in the direction of a strong and efficient educational administration. It was, however, like much good early legislation, in advance of public sentiment, and the law was soon materially modified. In 1839 the county school tax was cut in half, the township taxes were reduced, and the township superintendents' supervisory powers were materially lessened. In 1840 the office of State Superintendent of Common Schools was abolished, and the duties of the office transferred to the Secretary of State. The clause in the law requiring reading, writing, and arithmetic to be taught in the English language was repealed, and German district schools were reorganized. The first attempt at a graded course of study was issued this year. In 1842 the enumeration of children was taken from the township superintendent and restored to the district clerks, and the term of the district school director was lengthened from one to three years. In 1847 the county school tax was further reduced to two-thirds of a mill.

On the other hand, some constructive legislation for both city and district schools was enacted during this period. The city legislation began in 1829, when the first special city school law (Cincinnati) was enacted, and it was continued in 1839 by a special law for Zanesville, in 1845 for Columbus, in 1846 for Dayton, in 1847 for Akron, and in 1848 for Cleveland. Night schools were first authorized in 1839, but only for males. The Akron law, at first applying only to Dayton and Akron, was soon amended to apply to all cities and incorporated towns, two thirds of whose inhabitants petitioned the council for special city or town school organization. This law gave the Board of Education power to establish "a central grammar school where instruction should be given in the various branches and parts of study not provided for in the primary schools and yet requisite to a respectable English education." The Cincinnati central high school dates from 1847. In 1849 another similar law was enacted which gave the school corporations greater powers, and extended union school privileges to townships and school districts having 500 or more inhabitants. The Akron law and the law of 1849 mark the establishment of the graded and town school system in Ohio.

For the township and district schools, other minor legislation was enacted before 1853. In 1846 school districts were authorized to establish school libraries, and to expend therefor $30 the first year and $10 thereafter. In 1847 county teachers' institutes were authorized and funds for maintaining them provided. The Ohio State Teachers' Association held its first meeting this year. The same year county superintendents were authorized to be appointed in twenty-five specified counties, but this law was repealed in 1853. In 1848 the establishment of schools for negroes, debarred from educational privileges since 1829, was authorized, and the next year the establishment of separate schools for negroes was made optional. An effort to get better school returns was made by a law of 1848, requiring teachers to make an annual report to the township treasurer, but it was not until 1858 that complete returns from all of the counties were for the first time made. In 1849 the first advance beyond the 3 R's was made by a law adding English grammar and geography to the subjects for teachers' examinations, and to any school, on petition of three or more householders. In 1850 a law was passed creating a State Board of Public Instruction, state district supervision, state uniformity in teachers' examination questions, and state life diplomas; but the legislature failed to appoint the five persons provided for, and the law never went into effect. A city superintendent of schools for Cincinnati was first authorized in 1850. In 1851 the law of 1838 was restored in most of its important particulars. The township clerk was restored to his full powers as township school superintendent, and given $1 a day additional for time spent in school visitation. The annual district meeting remained strong, but district directors were now allowed to levy $50 without a vote of the district, the county school tax was restored to 1 mill, and the income from the state common school fund was increased to $300,000 a year.

In 1850 a new state constitution was prepared and adopted by the people. This contained but a brief article on education, merely guaranteeing the security of all educational and religious funds, directing the legislature to provide for free schools, and prohibiting sectarian aid from any school funds. Under this new constitution, the third important school law for Ohio (the Rice Act of 1853) was enacted, abolishing the rate bill and making other important changes and improvements. A State Commissioner of Common Schools, to be elected by the people for three-year terms, was created, and a state school tax of three mills, to provide free education for all, took the place of the $300,000 lump sum previously distributed. A state tax of one tenth of a mill was also added for common school libraries. The county school tax disappeared, and township taxation for schools superseded district taxation. County superintendents were abolished, but county boards of examiners, to be appointed by the probate judge, were continued, and $1.50 a day was now granted to them for their services. Orthography was added to the list of examination subjects for teachers. Evening schools were opened for the first time to both sexes; separate schools for colored pupils were permitted in districts having thirty or more colored pupils; and the minimum school term was increased from six to seven months. The beginnings of township control were made in the, at first nominal, subordination of the district system. The school districts were reduced to subdistricts and deprived of their corporate powers, though each retained three trustees. The school district meeting was also abolished, except for the annual election of one trustee. The subdistrict trustees still retained the power to elect teachers, inspect the schools, build and repair buildings, and purchase supplies. The clerk of each subdistrict board, together with the township clerk, now became a township school board, with the township treasurer, *ex officio*, as treasurer of the board. This township board was given oversight of all school property, estimated the township school tax, made regulations relating to studies, textbooks, and discipline, and fixed the boundaries of the subdistricts. Township boards were authorized to appoint one of their own members as township school manager, though few such appointments were ever made. The control of any " central or high school " maintained by the township was vested in the township board. Any township might establish schools higher than the primary grade, if approved by the voters of the township. Cities and villages were given power to establish " central or high schools " without approval by the voters of the district. In 1854 it was stated that at " the commencement of 1847 there was not a single well-organized public high school in the state, now there are more than forty in which thorough academic education is given, besides nearly an equal number in which instruction is given in some of the higher branches." Following this important organizing law, there was no other important educational legislation for twenty years.

The new school code of 1873 was a codification rather than a new school law. All preceding legislation was repealed, inconsistencies were straightened out and conflicts of authority eliminated, and the whole was restated in new form. It made no new contributions to the development of the state's school system, nor did it add any important element to the administrative machinery. It is classed, nevertheless, with the laws of 1825, 1838, and 1853, as marking a fourth stage in the development of the state school system. Its chief additions were a classification of city and town school corporations; the separation of school government from municipal government; any school district (city, town, or township) was authorized to appoint a superintendent of schools; an examination in the theory and practice of teaching was added to the examination subjects for all teachers; teachers' institutes were required in all counties, and separate city institutes were authorized; an end was put to German schools by ordering all instruction to be in the English language; the state school tax was further reduced to one mill, while district taxation up to seven mills was permitted. The next new school code was not enacted until 1904, and in the interval a number of important school laws were added.

In 1875 the expenditure of school moneys for evening schools, for books, apparatus, etc., was authorized for any city, town, or special district. In 1881 all districts were permitted to spend school money for school library purposes, and in 1893 all districts were permitted to establish evening schools. In 1882 United States history, in 1888 elementary physiology, in 1896 civil government, in 1904 literature, and in 1911 agriculture were added to the list of teachers' examination subjects. In 1882 the State Teachers' Reading Circle was organized and began its work. In 1887 an industrial department in Wilberforce University was established by the state. In 1888 the State Board of Examiners was increased to five, three grades of life certificates and four of county certificates were authorized, and boards of city school examiners were created. Still later, village boards of examiners were also created, so that little except the granting of rural certificates was left to the county boards of examination. In 1885 the union of township, village, and special districts to maintain a high school was permitted. In 1887 the laws requiring separate schools for colored pupils were repealed. In 1889 the first comprehensive school law was enacted, and this was amended and strengthened in 1890, 1893, 1898, and 1902. In 1891 an experience qualification was imposed for membership on county boards of examination. In 1885 the period for textbook adoptions, fixed at two years by the first legislation on the subject in 1871, was increased to five years, and boards of education were authorized to buy textbooks and supplies and to furnish them to pupils at cost. In 1890 a schoolbook board was created, to approve books and fix prices. In 1891 this board was authorized to contract with authors or compilers direct, and in 1894 all boards of education were permitted to supply free textbooks, and to levy an additional tax for the purpose.

In 1892 the process of subordinating the district system to township control, begun in 1853, reached its culmination in a law which abolished subdistrict trustees and created representative township boards to manage the schools of the townships. This constructive legislation was undone in 1898 by a law which restored the subdistrict director system, but two years later townships were permitted to abolish the subdistrict system by a vote of the people, and in 1904 the township was once more made the unit. In 1892 physical training in city schools was required, and in 1893 a schoolhouse sanitation law was enacted. In 1893 the kindergarten was included as a part of the public school system, and a local tax of one mill authorized therefor. In 1894 women were permitted to vote at school elections. In 1896 the United States flag was required on all schoolhouses. In 1898 the articulation of the county schools with the high schools was secured by a law providing for the examining and the awarding of diplomas to those completing the rural schools, and permitting any township board to pay the tuition of rural pupils at a high school. In 1898 two adjacent townships were permitted to unite to support a high school, and in 1900, and again in 1902, the payment of high school tuition was made mandatory. In 1894 the centralization of schools and the transportation of all pupils to a central school was begun in Kingsville Township, Ashtabula County; in 1896 the same plan was permitted in three counties; in 1898 the plan was permitted to be put in operation anywhere in the state; and in 1900 a revised law gave the initiative to the township boards, or, if they failed to exercise it, to the people by initiative proceedings.

Although a number of recommendations had been made by the State School Commissioners looking to the establishment of a normal school for the state, Ohio took no action until recently. In 1886 the first appropriation was made, consisting of $5000 a year, to Ohio University at Athens to establish a teachers' training course. This was done, but the appropriations grew steadily less, and in 1896 the course was dropped altogether. In 1900, after much agitation, and after receiving a petition containing over 20,000 signatures, the legislature finally made the first provision for normal schools in the history of the state. A state commission was appointed to locate one state normal school. In 1902 two state normal schools were created instead, by adding a normal school department to the two smaller state universities in the southern part of the state, — Miami University at Oxford and Ohio University at Athens. A State Normal School Commission was also created in 1902, to consider the location of additional normal schools. The Commission reported in 1903, recommending the creation of a State Board of Education of five, to have control of the schools, and to exercise a few other functions. No action was taken on this recommendation. In 1906 the legislature declared it as a state policy that the Ohio State University at Columbus might maintain a teachers' college, but should never maintain a normal department, and that the two state institutions in southern Ohio should not provide instruction extending beyond the A.B. and the A.M. degrees, thus clearly differentiating the work of the three state institutions. In 1910 two additional state normal schools were created, to be located in northern Ohio.

In 1902 the Brumbaugh law, classifying the school system of the state, and providing for three grades or classes of high schools, was enacted, and the child labor and compulsory education laws were re-written and harmonized. In 1902 a new municipal code was made necessary by a supreme court decision nullifying the Cleveland special legislation, and in 1904 a new and revised school code, the fifth for the state, was formulated and approved by the legislature. The school code of 1873 had been almost entirely changed by the amendments of thirty years. The new code not only gathered up and classified these changes, but itself made a number of additions of importance. The subdistrict system was finally eliminated, boards of education were given a four-year term, the school districts of the state were classified and their powers restated, school superintendents were given increased tenure and powers, village boards of examination were abolished and the certification laws were revised, teachers were ordered to be paid for attending county institutes, uniform questions for all teachers' examinations in the state were made mandatory, and the approval of all local courses of study by the Commissioner was required. In 1906 a minimum salary law was passed, which required a salary of $40 a month for an eight-month term. State aid for weak districts was provided to carry out the law. In 1909 two high school inspectors were authorized for the State Commissioner's office, and the State Inspector of Workshops and Factories was given power to inspect school buildings and to approve all schoolhouse plans. In 1910 the commission on the recodification of the laws made its report; the report was accepted by the legislature, and a new edition of the recodified laws was issued. In 1911 agriculture was added to the subjects to be taught in the public schools, and was made a required subject for teachers' certificates after August, 1912. The state was also to be divided into four agricultural districts, with a district supervisor of agricultural instruction to be appointed by the State School Commissioner for each. In 1912 a constitutional convention met to revise the constitution of the state.

Present School System. — At the head of the present school system of Ohio is a State Commissioner of Common Schools, elected biennially by the people. His duties are largely clerical and supervisory, with no important powers lodged in the state office. The duties of the State Commissioner include office work, visiting the judicial districts of the state each year, meeting school officials, delivering lectures, preparing blank forms and issuing the school laws, issuing an Arbor Day manual, preparing all questions for the examination of teachers and for eighth-grade examinations, and making an annual report to the Governor. He has supervision of the school funds and, on complaint, may appoint an examiner to examine into the funds of any district. All private and denominational schools make statistical reports to him each year. He has the appointment (1909) of two state high school inspectors, who visit the high and other schools of the state, assist at and inspect teachers' institutes, and virtually act as Deputy State Commissioners. He also has the appointment (1911) of four district supervisors of agriculture, who are also in effect state deputies, and are appinted for two-year periods at a salary of $2000 a year. The State Commissioner also appoints each year one member of the State Board of Examiners. The State School Commissioner has few other functions. As in Massachusetts, what he can accomplish depends largely on the personality of the Commissioner himself. Excepting a State Board of Examiners, to grant life certificates, there are no state educational boards. The system is essentially decentralized.

With the exception of the years 1847 to 1853, Ohio has never had the office of county superintendent. A county board of examiners for teachers' certificates has existed since 1825, and still constitutes the only county educational authority. A county board of three is appointed by the probate judge, one each year for three-year terms. Two of the three have taught at least two years, and also within five years; all must be residents of the county; and each must not be connected with any private or parochial school, or with a book firm. This board holds monthly examinations for teachers' certificates, examinations for graduation from the common schools in April and May, and conducts a county grammar school commencement in August. The pay of the members is regulated by the number examined, and is small. The State Auditor apportions the school funds to the counties, and the county auditor makes the county apportionments, and receives and transmits all school reports.

The real authority and government of the schools of Ohio rests with the school districts, of which there are four kinds: (1) Each city is a city school district; (2) each village having a $100,000 valuation, and others by majority vote, is a village school district; (3) each civil township, with any attached territory, and excluding separately organized villages or cities, is a township school district, and (4) any contiguous territory, outside of cities and towns, having $100,000 valuation, may be organized as a special school district, Adjacent territory may be annexed to any school district, or transferred from one to another by mutual consent, or by petition and hearing before the probate judge. Except in cities, all school districts have boards of education of five members, elected at large, and for four-year terms, only part going out of office each biennium. Cities under 50,000 inhabitants have boards of education of from three to seven, elected similarly at large and for four-year terms while larger cities may vary from four to thirty-seven, part at large and part by subdistricts. (See CINCINNATI; CLEVELAND; COLUMBUS.) Women may vote at all school elections. Each board is a body politic and corporate, and may make rules and regulations for its own government, not inconsistent with law. The city, village, or township treasurer acts *ex officio* as treasurer for the district, but in special districts a district treasurer is appointed. In township districts, the township clerk acts *ex officio* as clerk of the district, but in other districts the board elects or designates the clerk. The clerk, or the clerk together with the superintendent, if there be one, makes an annual report to the county auditor. Township districts are subdivided into subdistricts, unless the same have been abandoned and the township centralized. If the subdistricts still exist, which is the usual condition, a director is elected annually in each subdistrict to have charge of the school property, to provide fuel and repairs, and to act as a means of communication between the people of the subdistricts and the township board. The township board on its own initiative, and, on petition of one fourth of the electors, must submit the question of centralization to a vote. If carried, all subdistricts are abolished and the schools of the township are operated as a unit. Small schools may, however, be abandoned and the children transported.

Every board of education has charge of the school buildings in its district, may condemn land for school purposes, and may repair, rent, or build school buildings, within the limits of its funds. A graded course of study must be adopted and approved by the State School Commissioner. A sufficient number of schools must be maintained for not less than eight nor more than ten months, though boards in cities may provide vacation schools and playgrounds, in addition. Any school board may establish a public library, appoint a board of library trustees, and levy a tax up to one mill for its maintenance. If no public library is maintained, up to $250 may be appropriated annually for school libraries. Boards may also found and maintain a museum in connection with the library. Cities may maintain special schools for tubercular children, and any school district may be authorized by the State School Commissioner to provide day schools for the oral instruction of the deaf. Cities may establish a city normal school, and may provide separate teachers' institutes. Any board of education may establish a high school, without a vote of the people, if the funds at hand will permit. High schools must be maintained at least seven months for third grade high schools, and at least eight months for all other classes. Any school district, on petition of twenty-five eligible pupils, must provide instruction in evening schools, to which adults may also be admitted. Districts may also provide instruction in manual training, domestic science, agriculture, or commercial work, or establish trade or vocational schools. Boards of education may appoint teachers, a superintendent, truant officers, medical inspectors, and a superintendent of buildings. In cities, the superintendent has the nomination of teachers, and city boards may appoint a school director, who acts as a business manager. Cities may employ a superintendent for any period up to five years, while in all other districts a superintendent may be employed from one to three years. Each board of education adopts its own textbooks for five-year periods, from lists furnished by the State School Commissioner, from publishers who will agree to provide books at not over 75 per cent of the wholesale list price, and boards may either sell the books to the pupils at cost or provide free textbooks. All instruction must be in the English language, though instruction in German as a subject of study is permitted.

School Support. — The state now makes an annual appropriation from the treasury equal to $2 for each child, six to twenty-one, in the state, not including married persons, as returned by the annual school census. This is approximately equal to the former one-mill state tax. The interest on the permanent school funds is also paid from the state treasury, and requires the equivalent of about one tenth of a mill. The interest on the sixteenth section funds is paid to the townships to which they belong; the state appropriations and interest on the state common school fund is made to the counties and school districts on school census; and the interest on the swamp land fund is apportioned to the counties on the basis of the number of males over twenty-one years in each. About 83 per cent of the school funds in Ohio come from local (district) taxation, the average levy in the townships (in 1910) being 7.71 mills, and 11.05 mills in the separate districts. No county school tax has been levied since 1853. Cities can not levy less than six mills, school boards in village and special districts may levy up to twelve mills, and in townships up to ten mills, while townships may levy five mills additional for high school purposes. Each district board estimates and levies the amount of money necessary for tuition, building, contingent, bond, and interest funds, and any district may levy five mills additional by vote of the people. Any city maintaining a municipal university may levy two mills additional for that purpose, and any township in which a state normal school is located may levy the same amount for it.

Teachers and Training. — The state employed 27,841 teachers in 1910, 3573 of whom were in high schools, and 8640 were men. For the training of future teachers the state now has four state normal schools (Athens, Bowling Green, Kent, and Oxford), and city training schools are maintained by five of the cities (Akron, Cleveland, Columbus, Dayton, and Toledo). Teachers' institutes are now maintained in each county annually, with about three fifths of the teachers in attendance. Schools may dismiss for institute for four days in cities and one week elsewhere, and teachers must be paid for such attendance. Teachers may be employed for from one to four-year periods in cities, and from one to three-year periods elsewhere. Any board of education may vote to establish a district pension fund, and after doing so must pay from 1 to 2 per cent of all income from taxation into this fund. All teachers accepting the provisions of the law also contribute $2 a month to the fund.

After twenty years of service, half of it in the district, the Board may retire any teacher, and after thirty years of service, half of it in the district, a teacher may ask for retirement. The maximum pension is $450. Teachers' certificates are granted for one, two, three, four, five, and eight-year periods, the one, two, and three-year certificates being classed as provisional certificates, and the five- and eight-year certificates being classed as professional certificates. The latter can be granted only after forty months of teaching experience, and are renewable. The four-year certificates are granted to graduates of professional courses in such normal schools and colleges, in Ohio or elsewhere, as have been approved by the State Commissioner of Common Schools. All certificates are also classified as (1) high school certificates, (2) elementary school certificates, and (3) special certificates. All examination questions are prepared by the State School Commissioner, and are uniform throughout the state. All high school teachers and superintendents of schools must hold a high school certificate. County boards of examination may recognize certificates from other counties, if they see fit. Life certificates are issued by the State Board of Examiners on the basis of experience and an examination in professional subjects. All teachers' certificates always date from September 1st, though twelve examinations are given each year. A state minimum salary law requires $40 a month for at least eight months each year.

Educational Conditions. — While Ohio has a large city population and a number of rapidly growing cities, still 44.1 per cent of the total population live in the rural districts. The southern part of the state is more rural than the northern. About one eighth of the total population is foreign born, though the foreign born element lives largely in the cities. Ohio is a manufacturing as well as an agricultural state. The people of the state have always clung closely to local government, so that the school system is weak as regards central control. It is only recently that a very decentralized form of school administration has been in part superseded by township control. The county administration is as yet quite weak. The centralization of schools for a time made some notable progress in parts of Ohio, though the movement apparently has about come to a standstill. As late as 1910, only 178 of the 1319 townships in forty-six of the eighty-eight counties reported any degree of centralization. One fourth of these townships were in four counties, and centralization had been completed in only fifty-five townships. Forty townships have also employed township superintendents. An eight months' school term is required by law, and state aid has been granted to weak districts to enable them to pay the minimum salary and still provide an eight-months' term. The school library system has been well developed, as have also the traveling libraries sent out by the Ohio State Library.

Secondary Education. — The high school has had a marked development in Ohio, there being about 850 high schools in the state. Nearly one fourth of these are township or township-union high schools. No special state aid is granted for secondary education, the high school being a tax on the district maintaining it. The high schools of the state are divided into three classes, four-year, three-year, and two-year. The two-year schools alone are allowed to drop to terms of seven months. There are two state high school inspectors, and the state university examiner also visits the high schools, but there is no state course of study for them.

Higher and Special Education. — The Ohio State University (*q.v.*) at Columbus, founded in 1870 as an agricultural and mechanical college and later developed into a large and important institution, stands as the culmination of the public school system of the state. The Ohio University (*q.v.*) at Athens and Miami University (*q.v.*) at Oxford are state institutions of collegiate rank and state normal schools combined. The state also grants aid for an industrial department for the colored race in Wilberforce University (*q.v.*). Toledo University and the University of Cincinnati (*q.v.*) are municipal institutions. Ohio is distinctively the state of small church colleges, there being twenty-six, with six others now classed as nonsectarian, although most of these were once denominational. Seven of these colleges date from before 1840, and almost all from before 1885. Sixteen of these have less than $150,000 of endowment funds to-day, and most of them are small and struggling institutions.

Of special institutions, the state maintains the State Institution for the Feeble-minded; the State School for the Blind; and the State School for the Deaf, all at Columbus; and the Ohio State Reformatory, at Mansfield. Two cities report day schools for the deaf.

E. P. C.

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OHIO STATE UNIVERSITY, COLUMBUS, OHIO. — An institution which grew out of the Morrill Act of 1862, commonly known as the Land Grant Act. In 1864 the legislature passed an act accepting the grant, but not until 1870 was the law enacted providing for the organization of the Ohio Agricultural and Mechanical College. In consideration of the location of the College, Franklin County provided a fund of $300,000 by a bond issue. This was subsequently increased by $25,000. Three hundred and thirty acres of land lying within the city limits west of High Street and three miles north of Capitol Square were purchased as a site. Additional purchases of adjacent land make an estate of 453 acres.

The College was opened for students on September 17, 1873. In 1878 the legislature reorganized the institution, changed the name to the Ohio State University, and made the first appropriation in the history of the state for higher education. The proceeds of the sale of the public lands were by law made a part of the irreducible debt of the State upon which the State pays 6 per cent interest. The statutes provide that all money given to the university, unless otherwise directed by the donor, shall become a part of this irreducible debt which is but another name for an endowment fund. That fund for general purposes now amounts to $167,687.62. The fund for designated purposes amounts to $65,631.31, making a total of $233,318.93.

The institution is governed by a board of seven trustees, appointed by the Governor and confirmed by the Senate, for terms of seven years. The organization provides for seven colleges as follows: Agriculture; Arts, Philosophy and Science; Education; Engineering; Law; Pharmacy, and Veterinary Medicine. There are at present (1912) twenty-six buildings used for instruction, three residences, Oxley Hall for young women, and the Ohio Union Building for general social and clubhouse purposes. The value of the plant, including the endowment mentioned above, as shown by the inventory is $5,624,933.70. The total income for the year ending June 30, 1911 was $924,611.11. The enrollment for the year ending June, 1911 was 3439. For the same year 422 degrees were granted. The graduate school was organized in September, 1912. The University faculty is composed of all persons having the rank of professor and now numbers eighty-three. The College faculties consist of all persons having the rank of assistant professor, associate professor, and professor, and now numbers 153. The instructional force includes about seventy additional members. The following have served as president: Edward Orton, 1873–1881; Walter Quincy Scott, 1881–1883; William Henry Scott, 1883–1895; James Hulme Canfield, 1895–1899; William Oxley Thompson, 1899–. W. O. T.

OHIO UNIVERSITY, ATHENS, OHIO.— The oldest higher institution of learning in the "Old Northwest." Before Ohio was admitted to statehood the Territorial Legislature, in session at Chillicothe on Jan. 9, 1802, made provision "that there shall be an University instituted and established in the town of Athens." The institution was to be named the American Western University. The Ohio State Legislature reënacted the provisions of the Territorial Act, with but few changes, by another act dated Feb. 18, 1804, which gave the name Ohio University to the institution to be established and has ever been regarded as the charter of Ohio University. Students were admitted in the spring of 1808, when Rev. Jacob Lindley, a Princeton graduate, was put in charge of its educational work. The whole number of degree graduates, of baccalaureate rank, in the history of the university, is: men, 669; women, 159; total, 828. The total number of different students enrolled increased from 405 in 1901 to 1832 in 1912. There is a faculty of seventy-five members.

The university buildings are twelve in number, not including five buildings occupied as residences. Conservative valuation of the property of the University is $1,500,000. The financial support of the university is derived from three sources, namely, the mill-tax, special appropriations, and local receipts from incidental fees, rents, and interest on permanent funds forming a part of the irreducible debt of the state of Ohio. Receipts from all these sources, in 1911, amounted to $253,366.05 Salary payments for the fiscal year ended Nov. 15,1911, amounted to $100,310.08, of which amount the sum of $81,095.52 was for teaching service exclusively.

Two degrees are given in the College of Liberal Arts, — A.B. and B.S. The degree of B.S. in Education is given those who complete the four-year courses in the State Normal College. To receive either of these degrees the student must have a credit of not less than 120 semester hours based upon at least fifteen units of secondary work. The field of instruction covered is shown by the following classification of colleges and departments: college of liberal arts; the state normal college; the college of music; the college of oratory; the school of commerce; the department of physics and electrical engineering, and the department of mathematics and civil engineering. A. E.

OHIO WESLEYAN UNIVERSITY, DELAWARE, OHIO. — Was founded under the patronage of the Methodist Episcopal Church in 1841, when an academy was opened. The charter was granted in 1842, and in 1844 the College of Liberal Arts began its work. In 1877 the Ohio Wesleyan Female College, established in Delaware in 1853, was incorporated in the university. Since this time the university has been coeducational in all departments. In addition to the college, the university now maintains an academy, and a Conservatory, including a School of Music and a School of Fine Arts, both established in 1877. The policy of the institution in recent years has been to enlarge the work and increase the efficiency of the college. Accordingly, the Cleveland College of Physicians and Surgeons, established in 1863 and made a part of the university in 1896, was in June, 1910, given over to the Medical Department of Western Reserve University. A School of Oratory, established in 1894, is now organized in connection with the college. A School of Business, established in 1895 and since 1908 organized as a part of the academy, was discontinued in June, 1912. The government of the institution is in the hands of a Board of Trustees elected by the Ohio, the North Ohio, the Cincinnati, and the Central Ohio Conferences of the Methodist Episcopal Church, the Association of Alumni, and five trustees-at-large elected by the Board. Students are admitted to the College by certificate from representative high schools or by examination. The entrance requirements are fifteen units. Undue specialization in elective work is guarded against by the distribution of subjects in groups, and the careful limitation of the student's courses in each. To differentiate the B.A. degree, a minimum of one year's work in college Latin or Greek is made a part of the language requirement; and for the B.S. a larger requirement in mathematics and science is provided than for the B.A. The total enrollment of students in 1912 was 1249. Of these 912 were in the college, 113 in the academy (including the School of Business), and 224 in the Conservatory. The faculty includes twenty-six persons of professorial grade, and forty instructors and assistants. The Rev. Herbert Welch, D.D., LL.D., is President.

H. W.

OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE, STILLWATER, OKLA. — A state institution organized in 1891 as a land grant college. The college is at the head of a system of state agricultural schools. It provides courses of instruction in agriculture, mechanical arts, engineering, military science, domestic science, training of teachers, and the related branches required by law. The college plant embraces eleven buildings and 1000 acres of land. Two years of high school work are required for entrance to the freshman class. The degree of B.S. is conferred in the different divisions of the college. The enrollment of students in 1911–1912, including all attending special and short courses, etc., 2100. The faculty includes seventy-one members.

OKLAHOMA STATE BAPTIST COLLEGE, BLACKWELL, OKLA. — A coeducational institution opened by the Oklahoma Baptist Convention in 1901. There are maintained an academy, college of liberal arts, college of fine arts, and business college. The entrance requirements to the college of liberal arts are fifteen units of high school work. The degree of B.A. is conferred. The enrollment in 1911–1912 was 208, and the faculty consisted of seventeen members.

OKLAHOMA CHRISTIAN UNIVERSITY, ENID, OKLA. — A coeducational institution opened in 1908. A preparatory school, colleges of liberal arts, bible, music, and business, schools of oratory and fine arts, a teachers' college, and hospital training school for nurses are maintained. The entrance requirements to the college of liberal arts are fifteen units of high school work. The following degrees are conferred: A.B., B.D., and A.M. The enrollment in 1911–1912 was 350 in all departments. The faculty consists of twenty-two members.

OKLAHOMA, STATE OF. — Originally a part of the Louisiana Purchase, and set aside for Indians in 1834. In 1848 the slender western extension was obtained from Mexico, and for a long time was known as the Public Land Strip. This strip and the western half of the present state were opened to settlement, April 22, 1889, and were organized as Oklahoma Territory in 1890, while the eastern half continued as an Indian reservation up to 1898, when a territorial form of government was provided for it also. In 1906 Congress authorized the two territories to unite and to apply for admission as one state, and in 1907 the two were admitted together as the forty-sixth state. Oklahoma is located in the western part of the South Central division. It has a land area of 69,414 square miles, which is about the same size as the six New England states and New Jersey combined. For administrative purposes the state is at present divided into seventy-six counties, and these in turn are divided into cities, towns, and school districts. In 1910 Oklahoma had a total population of 1,657,155, and a density of population of 23.9 persons per square mile.

Educational History. — On the opening of Oklahoma Territory to settlement the inrush of settlers was very rapid. On the first day, 20,000 people crossed the border, and the first night Guthrie, which in the morning had been a vacant plain, had a population of 10,000 people. Before the end of the year, 60,000 people were in the territory, and in the next ten years the population increased over 400 per cent. Government Indian schools had existed in parts of the territory for some time. The first white schools were opened in Guthrie, El Reno, Kingfisher, and some other towns in 1889. The first high school was opened in Kingfisher in the same year. In the organic act of 1890 Congress gave the new territory $50,000 to be used in organizing the first schools. The first territorial legislature in 1891 enacted a detailed school law, which provided for the township form of organization; for township boards, with important educational functions resting with the secretary; for county superintendents, a Territorial Superintendent and Auditor combined, and a Territorial Board of Education; for territorial diplomas, and for three grades of county certificates, with uniform examination questions prepared by the Territorial Board of Education; normal teachers' institutes; and for a free textbook system, but with no appropriation to carry it into effect. This law laid down the main outlines of the present school system. A State University, an Agricultural and Mechanical College, and the State Normal School, at Edmond, were also created in 1891. In this year Congress authorized the Governor of the Territory to lease the school lands by public bids, for periods not exceeding three years; so these lands have brought in some income for the schools from the first. The township system was soon found to be unsuited to the needs of the new state, and was abandoned in 1893 for the district system, with district meetings and district boards, and this form of organization has since been retained. A new school law was enacted at this time, based, in large part, on the law of 1891, and this 1893 code still remains as the substantial basis of the present school laws. The school legislation since 1893 has been more in the nature of additions than fundamental changes in the system then laid down.

In 1907 statehood for the two territories combined was attained and the new state began the task of organizing schools in the old Indian Territory, which had previously been practically without public schools. A few tribal common schools, manual labor institutions, and seminaries existed for the Indian population, and in some of the towns common schools for the whites had been formed, though none of the latter had existed over nine years, and most of them had been formed within the two to five years preceding statehood. There were no rural schools, and more than 150,000 children of school age had no opportunities for schooling. By the end of the first year, 2200 districts had been organized and schools established, and the beginning of the school year 1908–1909 saw 3441 rural schools in the old Oklahoma and 2200 in the Indian Territory, and about 3000 teachers in addition in city and town school systems in Oklahoma proper, or a total of 5641 school districts and about 9900 teachers employed in the new state nineteen years after settlement.

The state constitution of 1907 guaranteed the perpetuity as trusts of all lands and funds given for education; directed the legislature to establish and maintain a system of free schools, in which all the children of the state should be educated; provided for compulsory education during the period from eight to sixteen; directed that separate schools for the negro race be established and maintained with equal accommodations; provided for a uniform series of textbooks for the schools; directed the legislature to provide for instruction in the elements of agriculture, horticulture, stock feeding, and domestic science; vested the supervision of the schools in an *ex officio* State Board of Education; gave to the State Board of Agriculture the supervision of the state agricultural and mechanical colleges; provided for a Board of Commissioners to manage the school lands and funds; and provided for the election of a State Superintendent of Public Instruction, and for a county superintendent of public instruction for each county. The legislature of 1907–1908 made but few changes in the school law, the law of 1893 still being in use in large part. In addition to a few minor changes in the law this first legislature revised the textbook law, the normal institute law, and the separate school law. It also established the Oklahoma School for the Deaf at Sulphur; the Oklahoma School for the Blind at Fort Gibson; a home for destitute children at Pryor Creek; and a State School of Mines at Wilburton. A State Commission on Agricultural and Industrial Education, to establish a district secondary school of agriculture in each supreme court district in the state, at the rate of two a year; and an addition to the certification law to provide that all teachers, after 1909, must hold certificates covering agriculture and allied branches, were added in 1908. In 1909 a new salary schedule for county superintendents was adopted. In 1910 cities organized under charters were given liberty to determine the number and method of election of boards of education.

The legislation of 1911 was of fundamental importance. The most important measure was the reorganization of the State Board of Education. The constitution of 1907 had provided that, until otherwise ordered by the legislature, the State Board of Education should consist of the Governor, Superintendent of Public Instruction, Secretary of State, and the Attorney-General. In 1911 a new State Board of seven members, with greatly enlarged powers, succeeded to the powers formerly exercised by the old State Board of Education, the State Textbook Commission, and the boards of regents of the several state institutions. A constitutional amendment was also proposed to the people giving to the legislature power to levy taxes for schools, to provide a method for the distribution of the proceeds (the constitution of 1907 required a census basis of distribution), and to provide for state aid to secure a five months' school throughout the state. The State Superintendent was empowered to appoint a State Inspector of Schools, at $1800 and expenses, and county superintendents were given a clerk and enlarged allowances for visitation. A "union-graded or consolidated school district fund" was created, to be derived from the sale of Section 33 lands in Green County, the proceeds of which are to be distributed to the different counties approximately in proportion to the school census, and to aid in the construction of buildings for union and consolidated school districts. County superintendents had added to their powers that of employing teachers for all minority race (usually colored) school districts.

Present School System. — At the head of the present state school system of Oklahoma is a State Superintendent of Public Instruction and a State Board of Education. The State Superintendent is elected by the people for four-year terms, while the State Board consists of the State Superintendent as president, *ex officio*, and six persons, two of whom must be practical schoolmen, appointed by the Governor for six-year terms. Two of the appointed members go out of office each biennium, thus giving a continuing body. Once appointed, the members can be removed only for cause. The appointed members receive $6 a day and expenses for serving. The president may appoint a secretary at $2000 and a stenographer at $1200. This board has general supervision of the public schools and the state institutions of the state. It formulates courses of study for the common and high schools, the teachers' and pupils' reading circles, the county normal teachers' institutes, and the higher educational institutions of the state; it formulates rules and regulations concerning teachers' certificates; prepares all questions used at the examinations, and examines applicants for certificates; it prepares questions for the examination of graduates from the eighth grade of the common schools; it classifies the public schools of the state, and accredits schools; and it makes reports to the Governor and legislature, and prepares estimates for the educational appropriations. The board also succeeds to the powers of the former board of textbook commissioners, and selects and adopts a uniform series of textbooks, supplemental books, registers, reports, maps, charts, globes, and apparatus for the schools of the state, fixes their sale price, and makes contracts with publishers and manufacturers to furnish the same. Succeeding the boards of regents for the different state institutions, it controls the educational policy of the higher and special institutions of the state. A State Board of Land Commissioners, consisting of the Governor, Secretary of State, Auditor, State Superintendent, and president of the State Board of Agriculture, looks after the school lands and funds of the state. A State Commission on Agriculture and Industrial Education, consisting of the State Superintendent, the president of the State Board of Agriculture, and the president of the Agricultural and Mechanical College, and working under the direction of the State Board of Education and in harmony with the Agricultural and Mechanical College, the normal schools, and the State Board of Agriculture, has charge of the establishment of the secondary schools of agriculture in each judicial district. The State Superintendent of Public Instruction acts as the executive officer of the State Board of Education, and, as such, has general supervision of the instruction in the public schools of the state. He gives opinions to city and county superintendents on disputed educational matters, publishes the school laws, visits each county each year, approves of the arrangements made by county superintendents for county normal teachers' institutes, receives reports from school officers, and makes a biennial report to the State Board of Education and to the Governor. He is *ex officio* a member of the State Board of Education, the State Board of Land Commissioners, and the State Commission on Agricultural and Industrial Education. He has the appointment of a State Inspector of Schools, at $1800 and expenses, who acts for and with him in visiting schools.

For each county there is a county superintendent of public instruction, elected by the people for two-year terms. He receives a salary of from $1200 to $1800, according to the size of the county; receives his actual expenses for one visit to each school each year; and is also allowed to appoint a clerk at $600 a year. He has the general supervision of the schools of his county. He visits the schools and examines the instruction and the material conditions; confers with the district school officers, encourages teachers' associations, and holds a public meeting in each school district once each year for the consideration of educational questions; organizes a county teachers' normal institute each summer for the academic and professional instruction of his teachers; receives reports from the district clerks, appoints to fill vacancies on the district school boards, and provides each district with the necessary books, blanks, and registers; divides the county into school districts, black and white, and rearranges the same; appoints the teachers for the minority race (usually colored) schools in school districts; keeps a record of all teachers employed, of the semiannual apportionment of school funds, and of all his official acts; and makes a quarterly and an annual report to the State Superintendent.

All cities of the first class constitute separate school districts and may provide for the number, manner of election, and terms of their boards of education. In other cities, two are elected from each ward, for two-year terms, one half going out of office each year. All voting for boards of education must be on separate ballots. City boards are bodies corporate, and, excepting the treasurer, elect their own officers; have control of the city school property; may establish kindergartens and high schools as desired; may elect a city superintendent, who holds office at the pleasure of the board; may examine their own teachers, through an examining committee, consisting of the city superintendent and two persons appointed by the board; and may levy their own taxes, up to the limit allowed by law (seven mills for all city purposes, schools included).

Each county is divided into a number of school districts, for each of which the people, in annual district meeting in June, elect a district board of three, consisting of a director, clerk, and treasurer. One is elected by the annual meeting each year, and the county superintendent fills any vacancies on the board. The district meeting also has power to vote taxes, locate or change the location of schools, authorize the sale of school property, advise the district board as to litigation, and may determine the length of school term, above three months and less than nine. The clerk of the board attends to all reports and clerical matters, while the treasurer receives and pays out all moneys belonging to the district. The Board employs all teachers, manages the schools according to the law, and cares for the school property. If there are colored pupils in the district, they are transferred to some adjacent district, if less than ten in number, and separate schools must be maintained for them if more than ten. Separate school boards are also provided for in the latter case. The same holds true for a small number of white pupils in a colored district. In all minority race districts the teacher is appointed by the county superintendent, and the expense of maintenance is paid from a county tax, levied for the purpose. County commissioners may also provide a schoolhouse, at county expense, for the minority race, when the district is unable to do so. Equal equipment and instruction is to be furnished the two races.

Educational Conditions. — The white population is increasing so rapidly that the proportion of Indians and negroes, though numerically increasing in themselves, is rapidly decreasing. In twenty years, from 1890 to 1910, the white population increased eight and one third times, the colored population seven and two thirds times, and the Indian population increased but one fourth. The total population in 1910 was 87.2 per cent white, 8.3 per cent negro, and 4.5 per cent Indian. The eastern part of the state (the old Indian Territory) contains about two thirds of the negroes and about five sixths of the Indians. The white population is over 96 per cent native born. About 80 per cent of the population live in the rural districts, though the cities are increasing in population faster than the rural districts. The western part of the state has but a small percentage of illiteracy, and that in the eastern part, chiefly Indian and negro, is decreasing rapidly. The state is essentially an agricultural state with great future agricultural and mineral possibilities. In time it will be one of the richest of our states, and the large endowments for education and the intelligent character of the white population insure the development of a very important state school system.

The rural schools are graded, the standards for certification are up to the average, and a good graded course of study is in use. Union-graded schools and the consolidation of districts and the transportation of pupils are permitted. Though a young state, Oklahoma has already made greater progress in the consolidation of small schools than have many of the older states. Eighty-six consolidated districts were reported as formed by 1911, and the new " union-graded or consolidated school-district fund " will do much to help the consolidation movement. Agricultural instruction has recently been made a very important part of the instruction, the law of 1908 requiring that "the elements of agriculture, horticulture, animal husbandry, stock feeding, forestry, building roads, domestic science, and elementary economics " shall be a part of the instruction for all public schools. Since 1909, teachers have been required to show some knowledge of agriculture for certification. All rural school sites must not be smaller than one acre. All schools must be taught in the English language. The state has, for its needs, a relatively good compulsory education law. All children, eight to sixteen years of age, not disabled or incapacitated, must attend school from three to six months each year, as determined by the school board and the people of each district. All indigent pupils are furnished the necessary books to enable them to attend, and the children of a widowed mother, who is dependent on their labor for support, are, upon investigation, given scholarships, under which the county pays the mother the requisite maintenance. Any school board may appoint truant officers to enforce the law. A small school library fund is set aside in each district for the purchase of books. Women may vote at all school elections and on the same terms as men.

School Support. — Oklahoma was treated most generously by Congress on its admission to the Union. Sections 16 and 36 in Oklahoma proper, previously reserved, were given to the state for its permanent common school fund, and $5,000,000 in gold was given to the state in addition in lieu of the similar grants in the Indian Territory. The school section grants totaled 1,413,083 acres, and the minimum sale price was fixed at their appraised value. The lands have been valued at an average of $20 an acre and recent sales have markedly exceeded this sum. It is probable that a permanent school fund of from $40,000,000 to $50,000,000 will in time be built up from these land grants. The 5 per cent fund (see NATIONAL GOVERNMENT AND EDUCATION) was also granted for the permanent school fund. In addition to these grants for common schools, Section 13 in each township (706,540 acres) was also granted to the state, to be used, one third for the State University and the University Preparatory School, one third for the normal schools of the state, and one third for the agricultural and mechanical colleges for the two races. Section 33 was granted to the state for charitable and penal institutions and for public buildings, and part of this grant will also go for educational purposes (schoolhouses). In addition to these grants, and in lieu of the swamp land and internal improvement act grants (see NATIONAL GOVERNMENT AND EDUCATION) Congress made the state the following specific grants: —

For the State University	250,000 acres
For the University Preparatory School	150,000 acres
For the Agricultural College (white) .	250,000 acres
For the Agricultural College (colored) .	100,000 acres
For the State Normal Schools . . .	300,000 acres
Total specific grants	1,050,000 acres

These grants should produce even more than the section grants for common schools, as the state was able to locate these grants on any unoccupied government land, instead of taking fixed sections of land.

The interest on the state school fund and the income from the lease of school section lands is apportioned semiannually to the counties and districts on the basis of the number of children in each, six to twenty one years of age. This is worth about $1.80 per pupil per year at present. A constitutional amendment, to be voted on in 1912, proposes the authorization of a state tax and state aid to maintain a five months' school and gives the legislature power to change the basis of apportionment. In each county, all fines, penalties, forfeitures, proceeds of estrays, and marriage licenses are added to the county school fund, and county commissioners may also levy in addition a county school tax, but the total for all county taxes for current expenses, including schools, must not exceed six mills. This, together with the state funds received is apportioned to the districts on the school census basis. Counties supporting a county high school may also raise one mill additional for county high school purposes. Each school district may, in addition, vote an annual district tax, up to five mills, for all school purposes, and distribute this tax for different school purposes as it sees fit.

Teachers and Training. — The state employed 10,020 teachers in 1910 for the 5820 school districts in the state. Only about 8 per cent of these were teachers in the colored schools. County teachers' certificates are of three grades and are issued on examination for one, two, and three years, respectively. A temporary certificate is also issued and is much used. In each county a summer normal teachers' institute of from two to six weeks is held, and teachers attending this may have their certificates renewed. These summer normal institutes follow a course of academic and professional work outlined by the State Board of Education, and all institute conductors and instructors must be certificated by them. Four examinations for certificates are held each year. First-grade certificates are valid in any county in the state; second-grade certificates only in counties adjacent to the one in which they were issued; and third-grade certificates only in the county of issue. State certificates and diplomas are also issued by the State Board of Education. For the training of new teachers the state maintains six state normal schools, as follows: —

The Northeastern State Normal School, at Tahlequah.
The Southeastern State Normal School, at Durant.
The East Central State Normal School, at Ada.
The Central State Normal School, at Edmond.
The Northwestern State Normal School, at Alva.
The Southwestern State Normal School, at Weatherford.

Secondary Education. — Any district, town, or city may establish a high school, as may any county. Consolidated schools or union school districts may also establish a high school as a part of the regular instruction. Only a few county high schools have so far been established, but most of the cities and towns have provided them. A number of the centralized schools have a good high school as a part of the instruction provided, and the number of such schools may be expected to increase rapidly under the new (1911) state building aid provided. In 1911, 435 school districts reported classes above the eighth grade, and fifty-one accredited high schools also were reported. The University Preparatory School, at Tonkawa, is a large state secondary school for whites, offering the classics, science, modern languages, business courses, and instruction in art, domestic science, manual training, music, and military tactics. A second school of this type was established in 1911 at Claremore. In 1908 the first two of the state agricultural high schools for whites were established at Warner and Tishomingo; in 1910 four more were established at Broken Arrow, Helena, Lawton, and Goodwell. These schools are to be agricultural and industrial schools of secondary grade, and must provide instruction leading to the agricultural and mechanical colleges and to the state normal schools. The State Agricultural College is to be the technical head of this agricultural system of education, and is to issue a course in agriculture and related subjects for the elementary and secondary schools of the state. Each state agricultural high school must have at least eighty acres of land, and must conduct an experimental farm and offer short courses for farmers each winter. Twenty thousand dollars was appropriated by the state for a building for each school.

Higher and Special Education. — The State University at Norman, the State Agricultural and Mechanical College at Stillwater, the State Industrial Institute and College for Girls at Chichasha, and the Colored Agricultural and Normal University at Langston stand as the culmination of the educational system of the state. The State School of Mines at Wilburton is also a part of the state's higher educational system. The denominational college has found but little demand for its services so far in the state, and only four are reported. All of these are institutions of very limited endowment. The Oklahoma Industrial Institution for the Colored Deaf, Blind, and Orphans at Taft; the Oklahoma School for the Blind at Fort Gibson; the State School for the Deaf at Sulphur; the State Orphans' Home and School for Destitute Children at Pryor Creek; the State School for the Feeble-Minded at Enid; and the State Training (Reformatory) School at Paul's Valley, are the special institutions supported by the state. E. P. C.

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OKLAHOMA, STATE UNIVERSITY OF, NORMAN, OKLA. — A coeducational institution established at Norman by act of the territorial legislature in 1892. The following schools and colleges are maintained: college of arts and sciences (1893); school of pharmacy (1893, 1908); school of medicine (1910), school of fine arts (1903); school of applied science and school of mines (1904); summer school (1908); college of engineering (1909); school of law (1909); school of teaching (1909). The entrance requirements are the completion of four years of high school work. The usual degrees are conferred on graduates and undergraduates on the completion of the appropriate requirements. The university is supported from the general revenue of the state and from income derived from lands granted by Congress. The enrollment in all departments in 1911–1912 was 793. The faculty consists of ninety-seven members.

OLD AGE. — See SENASCENCE.

OLDENBURG, GRAND DUCHY OF, EDUCATION IN. — See GERMAN EMPIRE, EDUCATION IN.

OLFACTORY SENSATIONS. — The sense organ of smell is the olfactory membrane in the upper part of the nasal cavity, where the endings of the olfactory nerves come to the surface. The organ is stimulated by chemical responses induced by the particles of the odorous substance borne in the air. It is not known how many simple smell qualities there may be. That there are specific qualities with distinct structures is probable from the fact that when the nose has been fatigued for one odor, certain odors will not be noticed, while others will give sensations of normal intensity. Disease may also render one insensitive to several odors, while still normally sensitive to others. These experiments and observations have not been carried far enough to give a complete classification of smells. W. B. P.

See ODORS.

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ANGELL, J. R. *Psychology.* (New York, 1906.)
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OLIVER, HENRY KEMBLE (1800–1885). — Leader in the movement for child labor legislation; was graduated from Dartmouth College in 1818. He was principal of high schools at Salem, Mass., 1819 to 1830, and of a private secondary school from 1830 to 1844. He was Adjutant-general of Massachusetts for four years. In 1848 he engaged in the textile industry at Lawrence; and during the next eighteen years he added to his business duties enormous public labors. He was member of the school committee of Lawrence, mayor of the city, and member of the state legislature. He gave up business in 1866 to accept a post as agent of the Massachusetts State Board of Education. He made extended studies of the conditions of factory children and was one of the earliest advocates of child labor laws. In 1869 he was made chief of the Massachusetts Bureau of Labor Statistics. Under the administrations of Horace Mann and George S. Boutwell (*qq.v.*), Mr. Oliver rendered important service as an institute lecturer in Massachusetts. His publications include numerous papers on education and a series of schoolbooks on music. W. S. M.

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OLIVER, H. K. How I was educated from six to fourteen. *Proceedings of the American Institute of Instruction* (1871).

OLIVET COLLEGE, OLIVET, MICH. — A coeducational institution founded in 1844 by Mr. J. J. Shipherd eleven years after he founded Oberlin. From the first it has been undenominational. The Congregationalists partially adopted the college, and it is now known as the Congregational College of Michigan, although without any organic relation to the denomination. Olivet has been vitally connected with the educational interests of Michigan. Its professors have served for many years in the office of the State Superintendent of Public Instruction and on the State Board of Education, and through their public lectures and published bulletins have had marked effect on the educational development of the state. The present value of the grounds, the fourteen buildings, equipment, and endowment amounts to about $600,000. The library, museum of natural history, and equipment for teaching sciences are exceptionally good. The usual undergraduate departments, including music, are maintained. The entrance requirements for all students who intend to proceed to the degree (B.A.) are fifteen units of high school work. The enrollment in 1910–1911 was 238 students. The faculty consists of twenty-four members.

E. G. L.

OLMSTED, DENISON (1791–1859). — College professor and author of science textbooks; was graduated from Yale College in 1813. He was tutor at Yale and for ten years professor in the University of North Carolina. From 1825 to 1859 he held a professorship at Yale. In 1840 he was made a member of the Board of Commissioners of Common Schools in Connecticut. His educational writings include *State of Education in Connecticut*, *An Academy for Schoolmasters* (in which he outlined a scheme for a college for the training of teachers), and *Ideals of a Perfect Teacher*. His textbooks include *Natural Philosophy* (1831), *School Philosophy* (1832), *Astronomy* (1839), and *Rudiments of Natural Philosophy and Astronomy* (1842). Professor Olmsted was actively identified with the American Institute of Instruction and the American Association for the Advancement of Education (*qq.v.*).

W. S. M.

OLNEY, JESSE (1798–1872). — Textbook author; was educated in the common schools. For several years he taught in the district schools of New York and later in the Hartford Grammar School. For ten years he was a member of the Connecticut legislature. He was the author of many schoolbooks, including geographies, readers, arithmetics, and histories. His common school geography passed through ninety-eight editions, and its sale is said to have been exceeded in its day only by Noah Webster's spelling book.

W. S. M.

OLYMPIC GAMES. — Probably growing out of very ancient local athletic festivals, the Olympic Games in Elis were the oldest and greatest of the Panhellenic festivals. The nationalization of this festival is asssigned traditionally to the year 776 B.C. The Greek era began with the Olympic games celebrated once in four years, and every period of four years was called an Olympiad. It was from the first under the charge of the Eleians, but they invited competitors from neighboring states, and the custom of attending the games spread to more distant cities. From an Eleian event, the festival became Peloponnesian and finally Panhellenic. Early in the sixth century, other festivals were established: the Pythian games, celebrated on the Krissean Plain; the Nemean games, held in the groves of Nema; and the Isthmian games, which took place at Corinth. These festivals survived to the close of Greek history, but the Olympic games continued to be the most glorious until the end.

The original motive for these festivals was the glorification of the strong and agile body. Athletic contests always constituted the chief attractions, but the festivals served to bring together the greatest lyric poets, sages, statesmen, orators, artists, sculptors, and potters. These celebrations were great national holidays which served as pleasant occasions of reunion for congenial spirits and tended to the diffusion of national ideas.

According to a fairly reliable tradition there was originally, and for twelve following Olympiads, only one contest: the δρόμος, a foot race, consisting of a single lap of a stadion of 200 yards. Other races of two, seven, twelve, and perhaps twenty-four laps were added later. About the time of the eighteenth Olympiad, the wrestling match and the Pentathlon (*q.v.*) made their appearance. An athlete had to win at least three of the contests to be crowned victor of the Pentathlon. Boxing and the chariot race are said to have been added in the twenty-third Olympiad. The games gradually grew more and more elaborate, and the time over which they extended was increased from a single day to five or six.

The festival was conducted by about ten judges, elected by the people of Elis a year beforehand. The candidates for the various contests were required to present themselves for examination thirty days before the festival. Each candidate must prove himself to be of pure Hellenic stock, and must give evidence of having trained during ten months in a gymnasium. During the last thirty days before the festival, the candidates practiced in the gymnasium under the supervision of the judges. After an athlete had been entered for a contest, it was considered the greatest ignominy for him to withdraw for any reason; indeed, for so doing he was heavily fined. Eleven days before the festival, the judges caused to be proclaimed by heralds throughout all the cities of Hellas the truce, sacred to Olympian Zeus, which was to last one month. It was this truce that made the Olympia possible as a Panhellenic institution, for during the thirty days' truce, all wars between Hellenic states were held in abeyance, and travelers were allowed to journey through them unmolested.

The athletic contests were conducted with much attention to details. In the foot races they were very particular that all should start at the same time and from the same line, and no fraud or trickery was permitted. It was also contrary to rule for an athlete to slacken his speed purposely to allow his fellow contestant to win. The foot races were run in heats of four, and the winners of each heat ran in the final race, in which the winner was crowned as victor. The victor in the running race at Olympia was regarded as an honor to his country, and gave his name to the current Olympiad, and on reaching home entered his native city to the notes of a triumphant song, written by a Pindar or Simonides. The last Olympiad was the 293d and ended in 394 A.D.

Modern Revival of Olympic Games. — After a lapse of more than 1500 years, the Olympic games were revived at Athens in 1896 under circumstances of interest to the modern educator. The motive behind the movement for the organization of the modern Olympic games was the interest of a French nobleman in educational reform. Baron Pierre de Coubertin, after leaving the *École des Sciences politiques* in 1883, spent some time in England studying the educational and social conditions in the public schools. He was profoundly impressed with the educational ideals of Thomas Arnold (*q.v.*) as described in *Tom Brown's Schooldays*, and exemplified in the English public schools. He appreciated the large educational value of athletic sports in the physical, social, and moral development of adolescent boys and resolved to devote himself to the task of securing similar educational advantages for his fellow countrymen.

Ten years of energetic and persistent effort brought only meager results. During this period De Coubertin introduced sports in a few schools and *lycées* in Paris, he organized athletic contests in connection with the Paris exposition of 1889, he made a tour to study physical education in American colleges, he organized an athletic union in France, and edited a magazine, the *Athletic Review*. He encountered much opposition and indifference in his efforts to popularize athletics in France. At a conference held at the Sorbonne in 1892, in connection with the jubilee of the French Athletic Union, Baron de Coubertin made an address on "Physical Exercises in Antiquity, the Middle Ages, and Modern Times," and advocated the revival of the Olympic games. With the coöperation of Professor William Milligan Sloane, then of Princeton, and Mr. C. Herbert, secretary of the Amateur Athletic Union of England, he organized the Paris International Congress for the study and propagation of the principles of amateurism, to be held in June, 1894. The last paragraph of the circular letter announcing the Congress contained the following statement: "The revival of the Olympic games in accordance with modern life and conditions would bring together every four years representatives of the world's nations, and one is justified in the belief that these peaceful and courteous contests would constitute the best form of internationalism."

The congress voted to inaugurate the modern Olympic games in 1896 at Athens, if possible, and to hold the second Olympiad in connection with the Paris exposition of 1900. These plans were carried out successfully under the direction of an International Olympic Games Committee, with Baron de Coubertin as president. The Greeks entered into the spirit of the movement with great enthusiasm. Representatives were present from many nations to compete in the various contests in running, jumping, throwing the discus, javelin, and weights, swimming, gymnastics, wrestling, fencing, shooting, etc. The games aroused world-wide interest and resulted in a remarkable expansion of all forms of physical education in many countries, particularly in continental Europe. The Olympic games were held again in Paris, 1900; St. Louis, 1904; Athens, 1906; London, 1908; and Stockholm, 1912. The 1916 games are to be held in Berlin. The object of the founders of this great educational movement has been realized in a large measure.

G. L. M.

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SULLIVAN, J. E. *The Olympic Games at Athens*, 1906. (New York, 1906.)

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OMAR KHAYYAM. — (Gi jāt ed-dīn, Abū'l-Fath, 'Omar ben Ibrāhīm el-Chaijāmī), the well-known author of the Persian poem, the *Rubāiyāt*, was better known to his own people as a writer of philosophical and mathematical works. He lived in eastern Persia in the eleventh century, and in 1074–1075 was making astronomical observations in Raj or Nishapur. He died at Nishapur about 1123–1124. Of his philosophical works, one on existence (*fī'l-wugūd*) is preserved in manuscript in Berlin. His algebra was published in Arabic and French by Woepcke (Paris, 1851). A work on the postulates of Euclid written by him is still extant in Leyden, and one on the mixture of metals is in Gotha, but neither has been published. A work at one time in Leyden, on difficult problems of arithmetic (*Mushkilāt et hisāb*), is apparently lost. The algebra

is one of the best works on the subject that appeared in the Arab-Persian ascendency.
D. E. S.

ONE SESSION OR TWO. — See SESSIONS, LENGTH OF.

ONE-SESSION PERIOD. — See SESSIONS, LENGTH OF.

ONTARIO AGRICULTURE COLLEGE, GUELPH, CANADA. — The Ontario Agricultural College was established by the Provincial Government of Ontario in 1873. The annual grants have increased, until now about a quarter of a million dollars is spent each year on its upkeep, besides the cost of additional new buildings from time to time. The objects of the institution are to give instruction in the best methods of farming, and the best methods of housekeeping, including thorough practical instruction in cooking and sewing and laundry work for every girl, and optional courses in horticulture, poultry raising, bee keeping, and dairying.

Under these circumstances the entrance requirements have been kept very low, so far as general education is concerned. Male students may enter upon the course in agriculture without any preliminary training, except good farm practice. Most matriculants are, however, fairly well prepared in the ordinary studies of the public school. From this number, by examination each year, are selected those who will be permitted to go on with the work of the third and fourth years, and those accomplishing the term work and passing the prescribed examinations are at the end of the four years admitted to the degree of Bachelor of the Science of Agriculture from the University of Toronto (*q.v.*), with which institution this college is affiliated. A diploma is given at the end of the first two years for practical knowledge and scientific equipment in practical farm operations. During the winter months short courses are held in stock and seed judging, poultry raising, butter and cheese making, fruit growing, beekeeping, and domestic science. Courses also are provided in elementary agriculture and nature study to prepare the teachers of the Province to give agricultural courses in elementary schools. Agriculture might well be taught in the public schools in rural districts. Teachers, however, were unprepared, notwithstanding that good textbooks had been written on the subject by practical men. Practical courses for teachers have recently been established lasting ten weeks in the spring and again five weeks in the summer. At the present time there are students in attendance from twenty-two different countries.
G. C. C.

ONTARIO, EDUCATION IN. — See CANADA, EDUCATION IN.

ONTOGENY. — A term used to designate the whole course of individual development. It is contrasted with philogeny, which is used to designate the course of general evolution in the species or race. A certain parallelism exists between ontogeny and philogeny. (See CULTURE EPOCHS THEORY.) C. H. J.

OPEN-AIR SCHOOLS. — The open-air school is a type of special school developed in Europe and America for the education of physically debilitated children. It is designed to make it possible for such children to continue their education and at the same time to regain their health and vitality. To attain these ends the classes are held in the open air, the children are well fed and warmly clad, and the formal work in the school subjects is reduced and modified.

The first school of this type was opened in Charlottenburg, a suburb of Berlin, in the year 1904. It was designed to meet the needs of a group of backward and physically debilitated pupils who could not carry the work in the regular schools and were not so mentally deficient as to be fit subjects for classes for subnormal pupils. The purpose of this educational innovation is reflected in the name "Open-Air Recovery School" which was used to describe it and which is still commonly employed in Europe in referring to schools of this type. The distinguishing characteristics of the régime in this pioneer open-air school included an outdoor life and abundance of good food, strict cleanliness, suitable clothing, skilled teachers, small classes, and school work modified in kind and reduced in quantity. The children who were the fortunate subjects of this first open-air experiment made wonderful progress. They increased rapidly in weight and strength, and many who had been suffering from serious ailments were entirely cured. Moreover, it was found that although these children had spent less than half as much time on school-work as their companions in the regular schools, they had not fallen back in their studies.

The reports of these combined physical and mental benefits spread throughout Germany and caused the school authorities of other cities to begin the erection of open air schools. In less than three years the movement had spread to England, and in 1907 London opened its first school. The results obtained were as remarkable as those previously reported from Germany, and again popular enthusiasm was aroused, with the result that other towns and cities throughout Great Britain began to plan for similar establishments.

Meanwhile the movement had spread to America, where the credit of starting the first open-air school must be shared by New York and Providence. In 1904 the former city loaned the services of one of its public school teachers and supplied school material for the children of an outdoor hospital for tuberculous children. The first American open-air school, as that term is now understood, was opened in January, 1908, in the city of Providence, R.I. The location was a room in an abandoned schoolhouse. This room was remodeled by converting the ordinary four-sided classroom into one of three sides, leaving one entire side open to the air. In this room the Providence authorities began in the dead of winter to teach a class of children variously termed anæmic and tuberculous. The children wore outdoor wraps, sat in warm sitting-out bags, and on cold days had warm soapstones at their feet. They were well fed, and their school studies were reduced in quantity. They immediately began to improve both physically and mentally and made marked advances in their school work. Six months after Providence began work, an open-air school for tuberculous children was started in one of the parks of Boston, Mass. There were forty-one children in the school, and after the first summer's work it was found that there were twenty-three cases where the disease had either been arrested or entirely cured. Five months later, in December, 1908, a new school was opened in New York City on an abandoned ferryboat. Chicago began work in the summer of 1909 in a camp in one of the school yards and later continued the work on the roof of a building in the heart of the city.

From these early beginnings the movement for open-air schools has rapidly spread in Germany, England, and America and has made considerable progress in France. In all these countries it is recognized that the open-air school has passed the experimental stage. In Germany it has become an integral part of the elementary school system. Among the municipalities having the new schools may be mentioned Mülhausen, München-Gladbach, Elberfeld, Lübeck, Berlin, Solingen, Cologne, and Aix, and there can be little doubt that within a few years the majority of the large industrial towns will have schools of this type. In general, German schools are modeled after the pioneer school at Charlottenburg. In all cases the principal characteristics are open-air treatment, plenty of good food, warm clothing, strict cleanliness, and expert medical and dental attention. The keynote of the schoolwork is constant change from work to play, reading, singing, and rest, together with constant stimulation of interest.

The record of progress in England is similar to that of Germany. Schools of the new type have been established in the suburbs of London, Manchester, Bradford, Halifax, and other industrial cities. In France open-air schools are being established in many cities, generally as developments of the "school colonies" which have for years furnished vacations in country places to city children. Records of the actual opening of schools of the new type in other countries are as yet lacking, but preparations for establishing them have been made in Scotland, Austria, Italy, Canada, Mexico, and Japan.

The open-air schools in other countries differ from most of those established in the Unites States in the class of children cared for. In the United States these schools are in general designed for the care of children suffering from tuberculosis in its incipient stages. They are essentially therapeutic agencies for the care of a special class of sick children. In Europe the aim is in general distinctly broader, and the schools receive as pupils children suffering from various forms of physical debility and subnormal vitality.

Popular interest and enthusiasm have been aroused by the success of the open-air schools in America to a degree which has seldom if ever been equaled by that shown for any other educational innovation. This has been stimulated by the unbroken record of success of the early schools. No single case of failure has yet been recorded, and no city that has undertaken the work has subsequently abandoned it. The rapidity with which the movement has spread is indicated by the following figures, showing the number of cities in the United States having open-air schools in each school year from the opening of the Providence school in 1908 to January, 1912:—

School Year	Number of Cities having Open-air Schools
1907–1908	3
1908–1909	7
1909–1910	15
1910–1911	32
1911–1912	44

Daily Program. — The daily programs differ in detail only in the different countries and cities. The following time-table, showing the procedure in an open-air school in New York City, may be considered typical of these programs:—

8.45 to 9.00	Arrive at school, get warm.
9.00 to 9.30	Fed with egg and large glassful of milk. Rest outdoors in sleeping blankets.
9.30 to 10.30	Schoolwork.
10.30 to 10.45	Short recess, feeding with milk and bread.
10.45 to 11.30	Schoolwork.
11.30 to 12.00	Recess, go to wash room and prepare for dinner.
12.00 to 12.30	Dinner.
12.30 to 2.00	Rest in bed, encouraged to sleep.
2.00 to 3.00	Schoolwork.
3.00 to 3.15	Short recess, feeding of milk and bread.
3.15 to 4.00	Schoolwork.
4.00 to 5.00	School dismissed, play an hour.
5.00	Go home.

Clothing. — Experience has conclusively demonstrated that, if children are to be benefited by the open-air treatment, they must be kept warm. This can only be accomplished during cold weather by providing them with sufficient clothing of the right sort. If they do not possess good wool underwear and warm, well-fitting outer garments, these must be supplied directly by the school or indirectly by some charitable agency. It is absolutely essential in cold climates that each child be provided with a heavy overcoat, sitting-out bag, two blankets, a wool cap, and warm gloves. In several cities the children are provided with Eskimo suits, which are made of heavy blanketing and put on over the regular house clothes. These suits have proved most satisfactory for the purpose and are unusually attractive in appearance. Extra shoes and stockings must be available to be substituted in case of need for those worn by children who come to school with wet feet. The most satisfactory outer foot covering for this purpose is the heavy wool felt boot reaching nearly to the knee. Wooden foot boxes, measuring about two feet long by a foot and a half wide and a foot high, and lined with quilting, are useful for keeping the children's feet warm when the temperature is low. The sitting-out bags are made of heavy blanketing covered with canvas and may be purchased from dealers in sanatorium equipment. They are cut and stitched so as to conform to the shape of the chair and may be attached to it by tape at different points to prevent the child in the bag from slipping off.

Food. — Only less important than warm clothing in securing successful results is wholesome and adequate food. In general practice does not differ widely from that developed in the original Charlottenburg school, where the daily routine is as follows: The children arrive at about a quarter before eight and receive a bowl of soup and a slice of bread and butter. Classes commence at eight with an interval of five minutes after each half hour's instruction. At ten o'clock the children receive one or two glasses of milk and another slice of bread and butter. Dinner is served at half past twelve and consists of about three ounces of meat, vegetables, and soup. After dinner the children rest or sleep for two hours. At four o'clock milk, rye bread, and jam are given. The last meal consists of soup and bread and butter and is given at a quarter before seven, after which the children return home. The expenditure for the feeding amounts to about twelve cents per day per child. Poor children are excused from paying, and the others pay in full or in part, according to the circumstances of their parents. American practice differs little from that described, except that the school day is shorter and hence the meals given are frequently reduced in number.

In addition to the meals taken at the school, the children have milk and bread, or cereal and milk, or sometimes an egg before leaving home in the morning, and again a light meal on their return home at night. This brings the total fuel value of the food eaten during the day up to about 3000 calories, which is probably high for a normal child, but not for these tuberculous children. The cost of feeding in America varies from about sixteen cents to about twenty-five cents per child per day.

Administration. — In most American cities the open-air schools are administered by a partnership of responsibility. In the majority of cases the Board of Education meets the cost for teachers' salaries, school premises, and schoolroom equipment, while the expense for food and clothing is defrayed by hopitals, charitable organizations, and societies for the prevention and cure of tuberculosis. At the close of the school year 1910–1911 data as to the administration of forty-seven open-air schools in different American cities were as follows: —

Board of education and tuberculosis association	20
Board of education and private association	11
Board of education only	7
Board of education and other city department	6
Tuberculosis association only	2
Board of education and private fund	1
	47

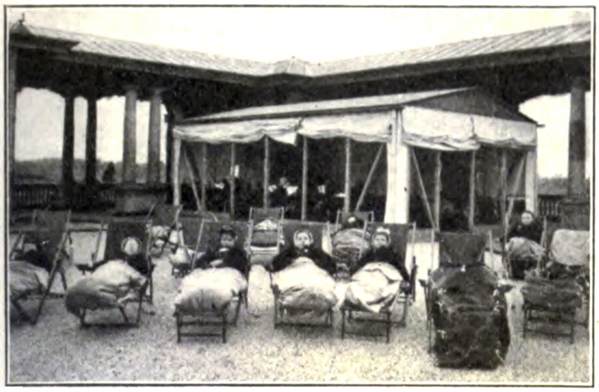
The premises occupied by the schools were as varied as the forms of administration. Among thirty-nine schools the following variations were found: —

Remodeled rooms	14
Special buildings	6
Roofs	6
Regular classrooms with open windows	5
Boats	5
Tents	2
Barn	1
	39

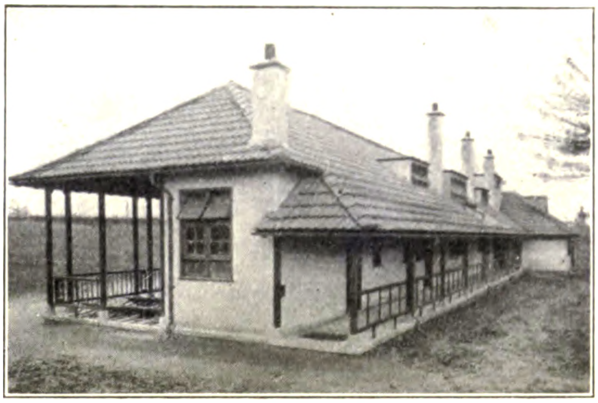
Expense. — The expense of conducting open-air schools depends in very large degree on local conditions. The only certainty is that the cost will always be greater than that of the ordinary class. The first reason for the added cost is that there are only about half as many children per teacher, the desirable limit being about twenty. In the second place the expense for food amounts to from sixteen to twenty-five cents per child per day. In the third place there is the individual equipment of each child, which is necessarily expensive. Its items with their cost are about as follows: —

Blanket	$5.00
Eskimo suit	3.50
Sitting-out bag	3.00
Cot	1.75
Felt boots	.50
Mittens	.40
Thermometer	.25
Toothbrush	.20
	$14.60

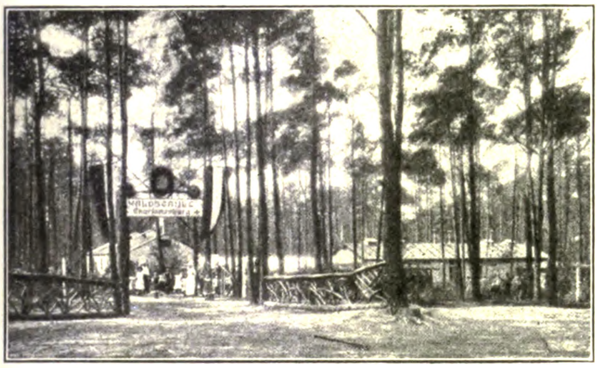
This individual equipment is in the nature of permanent investment, and can be used with slight replacement for several years. Taking all of these different added expenses into account, it is fair to say that the education of a child in an open-air school costs nearly three times as much as does the education of the same child in the ordinary school.



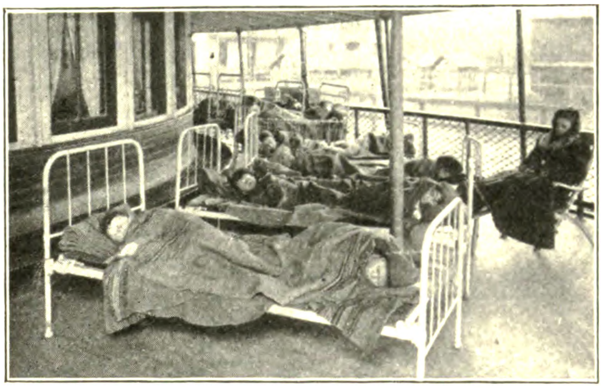
An Open-air School on the Roof, Boston.



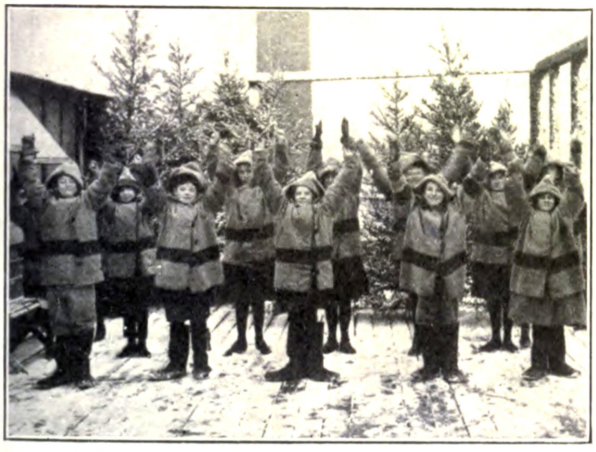
Special Building for an Open-air School, England.



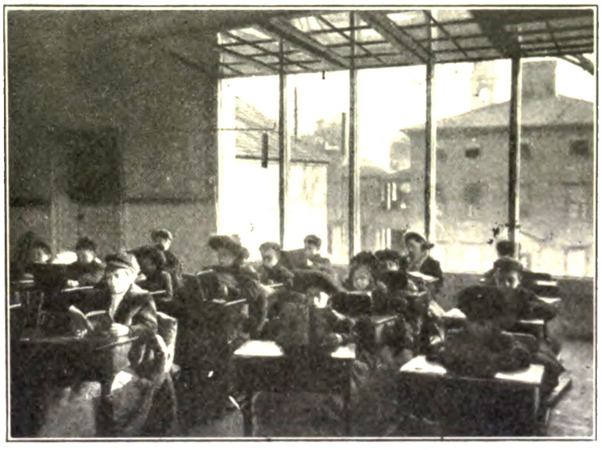
Forest School at Charlottenburg, Germany.



New York Open-air School on a Ferry Boat.
The Rest Hour.



Chicago Open-air School, showing Special Clothing.



An Open Window Schoolroom, Providence, R. I.

OPEN-AIR SCHOOLS.

The Need for Open-air Schools. — There seems to be little question that the open-air recovery school is the most efficient agency yet devised for carrying on the instruction of physically debilitated children and at the same time curing them or ameliorating the ailments from which they suffer. The best available data seem to indicate that the children who are in need of such treatment as that afforded by the open-air school constitute from 3 to 5 per cent of the daily membership in the average city school system. It would probably not be far out of the way to say that of these at least one third, or from 1 to 2 per cent of all, are either definitely suffering from tuberculosis or are "pretuberculous."

Summary. — The open-air school is a combination of sanatorium, playground, and schoolroom, in which the daily régime has been characterized as consisting of double rations of air, double rations of food, and half rations of work. There are eight requisites, of which the first three are imperatively essential: (1) abundance of pure air; (2) plenty of good food, and (3) sufficient warm clothing; (4) shelter from the wind, for experience teaches nothing more clearly than that it is wind and not low temperature that causes suffering from cold; (5) shelter or refuge where the children can be taken during very inclement weather, and where any child who gets chilly during the session may at once go to get warm; (6) provision for sleeping after the noonday meal. For this purpose short folding cots are much more satisfactory than the steamer chairs ordinarily used; (7) the services of a skillful doctor and a competent nurse. These do not, of course, have to be in attendance continuously, but should be available. Finally, it is essential to have in charge a teacher who is intelligent, able, and familiar with the methods and aims of the outdoor treatment.

L. P. A.

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OPENING EXERCISE. — It is usual to allot a short period of time to the formal opening of school or class work. The period allotted is from ten to twenty minutes. The exercises vary greatly in content and form; in the morning exercises of a school, announcements of general interest are made and matters of routine adjusted, readings and short addresses occupying the remainder of the time. This period is more largely in the hands of the pupils where the opening exercises are those of a single classroom. The opening exercise is important in starting the day's work with the requisite attitude. It is a valuable device in establishing and maintaining the group spirit of the class or school.

H. S.

See Bible in the Schools; School Management.

OPERATION. — See Symbols of Operation.

OPHTHALMIA NEONATORUM. — Purulent conjunctivitis, or inflammation of the eyes of new-born babies, is a specific germ disease, caused usually by a gonorrheal infection from the tissues of the mother during birth or from the careless use of towels, etc., later. The inflammation commonly appears on the third or fourth day, may be mistaken at first for mild conjunctivitis, but rapidly develops acute symptoms. If unchecked, it often leads to incurable blindness of one or both eyes, or marked impairment of vision through corneal scars. Estimates credit this malady as the cause of 50 per cent of the blindness in nurseries for blind babies, 25 per cent of the blindness in blind schools, and 10 per cent of the blindness in the United States. It is, then, the largest single cause of blindness. New York State health officials believe that, in 1910, the inflammation appeared in about one birth in a hundred.

Ophthalmia neonatorum may be prevented by washing the infant's eyes in sterile water after the head is born and by dropping two drops of 1 to 2 per cent solution of nitrate of silver directly upon the eyeball as soon after birth as possible. Even if the inflammation does appear, proper treatment will usually avert serious consequences, but the treatment must be prompt and be supplemented by careful nursing for several weeks, preferably in a hospital.

That so many cases of blindness occur, despite the simplicity of prophylaxis, is due to the ignorance of parents, midwives, and even of some physicians, of the source, the virulence, and the danger of the infection. To combat this ignorance, the American Medical Association has long maintained a committee on prevention of blindness, while the health departments and charitable organizations of the more progressive states have instituted vigorous "lay campaigns" of information. In New York and Massachusetts the disease is among those reportable to the health authorities.

G. M. W.

See Blind, Education of the.

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Valuable popular literature is distributed gratis by the State School for the Blind, Columbus, Ohio; by the Massachusetts Commission for the Blind, 309 Ford Bldg., Boston; and by the Special Committee on Prevention of the New York Association for the Blind, 289 Fourth Ave., New York City.

OPINION. — A term given to beliefs of a peculiarly personal or individual character, and to beliefs which, though generally current, lack scientific warrant, having their ground in custom rather than in evidence. (The term public opinion is used to denote the beliefs characteristic of a community in so far as these beliefs influence corporate or public action.) One of the objects of education is to produce the habit of mind which discriminates between opinion and grounded conviction, and which prevents opinions being held and asserted dogmatically. Plato among ancient educationalists and Locke among modern have especially insisted upon the harmfulness of confusing opinions and knowledge, and the importance of devising educational methods to safeguard the mind against this danger.

J. D.

See Knowledge.

OPTICAL ILLUSIONS. — See Illusions.

OPTICS. — The science of light, regarded as the medium of sight. The term is usually qualified by an adjective. *Physical* optics includes the reflection, refraction, absorption, diffraction, interference, etc., of light. *Psychological* and *physiological* optics include anatomy of the eye (gross and microscopic), dioptrics of the eye, the physiology of the visual apparatus, visual sensation, visual space perception, etc. Other restrictive terms are also used, such as *geometrical, meteorological.*

R. P. A.

See Eye.

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OPTIMISM. — The origin of the conception of optimism throws much light upon its nature. Plato had made the Idea of the Good the central principle of his metaphysics and of his dialectic. He had, however, admitted a passive principle in the constitution of the world sometimes called Matter, sometimes Non-being, sometimes The Other, which was capable of hindering the realization of this Good. Aristotle (*q.v.*) conceived of matter as the potentiality of a process through which ends as complete actualities are realized and thus did away with the Platonic dualism in that form. But in teaching that Nature always acts for the good, or for a final cause, he also admitted a principle of chance in things which was capable of preventing in particular cases the realization of the true end or Good. Aristotle's philosophy might thus be called an optimism upon the whole, tempered by the acknowledgment of unavoidable accidents in details. The Neoplatonists accounted for matter, resistance, and multiplicity by the idea of a series of emanations of which matter was the lowest. Its far remove from The One Good accounted for its appearance of evil. But even this appearance of evil was due to judging from only a partial standpoint; seen in its place in the whole, matter would be apprehended as contributing to its perfection.

St. Augustine (*q.v.*) adapted these conceptions to the needs of Christian apologetic. The conception of God as Creator compelled him to reject the idea that there is any principle of evil in matter or in the created cosmos at any point. Things that may seem evil to our finite judgment would be seen to enhance the goodness of the whole, could we but perceive from that standpoint. Real evil exists, however, but not cosmologically or metaphysically; it is due to the will of man in disobeying the divine command and substituting his will for the divine will. Even with respect to this, however, St. Augustine was so impressed with the sovereignty of the divine will and power, which must be absolutely good, that even sin was, metaphysically considered, privative rather than a positive reality. Through this influence of the great Father of the Church, optimism became an official part of Christian philosophy.

In the seventeenth century, Leibnitz in his *Théodicée* attempted, in terms of his philosophy of monads and their preëstablished harmony, a purely rationalistic proof that this is the best of all possible worlds. Modern optimistic theories, outside of professedly theological circles, really date from Leibnitz. Voltaire, instigated by the destructiveness of the Lisbon earthquake, ridiculed the fashionable Leibnitzian optimism in his poem, *Candide.* However, optimism was in the air in the eighteenth century, being congenial to rationalistic deism and to the beliefs of the social reformers in the indefinite perfectibility of man. (See Condorcé.) Even Rousseau, with his anti-rationalistic tendencies, taught the original goodness of nature and of man, attributing evil to the influence of institutions in destroying equal liberty.

A contemporary of Leibnitz, the Dutch Jew Spinoza, had dealt to the metaphysical basis of optimism the most severe blow that it could have possibly received. He taught that Nature is what it must be by an absolute logical necessity and that considerations of good and evil alike are equally foreign to its nature. They are relative only to man with his desires. Spinoza's teaching had no influence for over a century. Finally the growth of mechanical science and of dislike for the doctrine of final causes in any form in connection with nature prepared the way for a general acceptance of the essentials of Spinoza's view. This change shifted the problem from the question whether the world, or Being, metaphysically considered, is good to the question whether Life, empirically considered, is a good; or in its popular statement whether "Life is worth living." The most marked tendency of recent discussion is the development of the conception of "Meliorism," the idea that at least there is a sufficient basis of goodness in life and its conditions so that by thought and earnest effort we may constantly make better things. This conception attacks optimism on the ground that it encourages a fatalistic contentment with things as they are; what is needed is the frank recognition of evils, not for the sake of accepting them as final, but for the sake of arousing energy to remedy them. The conception of progress practically takes the place of the old notion of the metaphysical Good. J. D.

OPTIONAL STUDIES. — See College, American, Section on *Administration of Curriculum.*

ORAL ARITHMETIC. — See Mental Arithmetic; Pestalozzi.

ORAL ENGLISH. — See Composition.

ORAL METHODS. — There are three characteristic modes by which the school can provide the child with experience and knowledge; one direct and the other two indirect: (1) The school may provide the child with direct sense impressions through objective teaching (*q.v.*). (2) It may convey the experiences of teachers and fellow pupils to the child through an oral presentation. (3) It may teach the child to read the recorded knowledge of the men and women with whom he has not had and cannot have personal contact. Traditionally, the second method of instruction has always held the central place in school-teaching. Even what teachers and children read, they finally convey to each other orally in the classroom. The name "recitation" applied to the class exercise implies the dominantly oral nature of school methods of teaching and learning. This dominance of oral teaching still holds true. Instruction through the use of objective teaching and other modes of giving direct sense impressions is not an old tradition in the schools. The difficulties of its use necessarily limit its employment. The still more recent movement toward teaching children how to study the written text in the independent pursuit of knowledge has not yet assumed a large place in the schools, though texts as a basis for oral discussion in class have always had a very important place.

All oral teaching has the advantage that it is rapid and subject to easy control by the teacher. Its weaknesses are that it tends to degenerate into mere verbalism and to allow the teacher's activities to dominate the teaching situation completely. Thus the teacher does most of the talking in the school, and the children are too often merely receptive. Again, children pronounce words glibly in reading without the real thought of what they read, and teachers frequently accept verbal definitions rather than actual applications of meanings. H. S.

See READING, TEACHING OF; LITERATURE, ENGLISH; LANGUAGE, ENGLISH; SPELLING, TEACHING OF.

ORATORY. — See ORATIONS, SCHOOL; DECLAMATION; DEBATING; and for the historical place of Oratory in Education see ROMAN EDUCATION; RENAISSANCE AND EDUCATION.

ORATORY, FRENCH CONGREGATION OF THE. — An order founded in France in 1611 by Cardinal Pierre de Bérulle, in imitation of the Congregation of the Oratory founded in 1575 by St. Philip Neri (1515–1595) in Italy. The Congregation consisted of priests, not monks, bound by no other vow than that of the priesthood. While not intended to undertake the education of any but priests, the French Oratorians were soon in charge of a number of colleges and seminaries not only in France, but in Spain and the Netherlands. In 1711 the education of boys was recognized as one of their special functions. Their chief colleges were at Dieppe, Mans, and Juilly, the last of which became the chief and model college. Besides colleges, including secondary departments, military schools, seminaries, and houses of study were maintained. The characteristic features of the Congregation were the absence of that militant and political spirit which marked the Jesuits, and an emphasis on liberal and Christian education. The liberal arts and humanities were not neglected, nor on the other side were the sciences despised. The close connection of many members of the Congregation with Cartesianism insured the introduction of science into the curriculum. The second superior, P. de Condren, drew up a *Ratio Studiorum* (1634) which was edited by P. Morin as the *Ratio Studiorum a magistris et professoribus Congregationis Oratorii Domini Jesu observanda* (1645). Later educational works were the *Entretiens sur les Sciences* (1683) of P. Lamy and *Méthodes d'étudier et d'enseigner* (1681) of P. Thomassin.

The chief educational contribution of the Oratorians, who in many respects come close to the Port Royalists, were: (1) The introduction of the vernacular and the exclusion of Latin until the fourth form. (2) The teaching of history, for which there was a chair in all their schools. This subject was taught in the vernacular throughout, and French history was taken up before the classical. Geography was taught in close connection with history. (3) New methods were employed in teaching the classics, Latin receiving more attention than Greek. Grammar was taught by the aid of the vernacular and oral expression was given greater emphasis than written themes. (4) Physics and chemistry had a place in the curriculum of some schools of the Oratorians. (5) In philosophy, as has already been observed, Cartesian influences were marked. In addition to the ordinary school subjects there were taught at Juilly ornamental arts, horse riding, music, and dancing. (See ACADEMIES, COURTLY.) Discipline in the school was gentle. The same professor took a class through from the first form to the class of philosophy, a practice which largely eliminated the question of discipline. To a certain extent the Oratorians employed the monitorial system, decurions being appointed to hear lessons under the supervision of a prefect of studies. The individual abilities were considered, and a certain amount of independence and freedom in studies was permitted under direction and supervision. Among distinguished members of the Congregation may be mentioned the teachers and philosophers, Lamy and Thomassin; preachers Mascaron and Massillon; exegetes Richard Simon and Duguet; the philosopher Malebranche (*q.v.*); and the statesman Daunou (*q.v.*). The Congregation was practically dissolved during the days of the Revolution. It was reconstituted in 1852 as the Oratory of the Immaculate Conception.

In England Cardinal Newman (*q.v.*) founded in 1847 an Oratory of St. Philip Neri, at Edgbaston since 1854. Several schools, two in Birmingham, have been established under the government of Fathers of the Congregation of the Oratory.

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ORBIS PICTUS. — See COMENIUS, JOHN AMOS.

ORCUTT, HIRAM (1815–1899). — Educational writer and journalist; was graduated from Dartmouth College in 1842. For five years he taught in the elementary schools of Vermont and for twelve years he was principal of secondary schools. He was later superintendent of the schools at Brattleboro, Vt. He was one of the organizers of the Vermont teachers' association, and for several years he edited the *Vermont School Journal*. In his later life he was associated with the *New England Journal of Education*. His published works include *Class-book of Poetry and Prose* (1847), *Teachers' Manual* (1871), *Home and School Training* (1874), *School Keeping* (1885), and *Personal Recollections* (1897). W. S. M.

ORDER IN THE SCHOOLROOM. — See School Management.

ORDINANCES OF 1785 AND 1787, EDUCATIONAL INFLUENCE AND RESULTS OF. — See National Government and Education; School Fund, Permanent.

OREGON AGRICULTURAL COLLEGE, CORVALLIS, ORE. — A land-grant college founded in pursuance of the Act of 1862. As there was no state institution in existence, the legislature from 1860 to 1885 made annual appropriations to Corvallis College, then under the control of the Methodist Episcopal Church, South. In 1885 the college became a state institution, the citizens of Benton County providing a central building. The college owns 360 acres of land and thirty buildings. Secondary and degree courses are offered, two years of high school work being required for entrance to the latter. Degree courses are given in the following branches: agriculture, forestry, domestic science and art, engineering, commerce, and pharmacy. Two-year secondary courses and short courses are also conducted. In 1911–1912 there was a total enrollment of 2868 students in all departments. The faculty consists of about 150 members.

OREGON, STATE OF. — A state in the Pacific northwest, carved from the original Oregon Territory, and confirmed to the United States in 1846 by the treaty with Great Britain. In 1848 the Territory of Oregon was organized by Congress; in 1853 Washington Territory was separated from it, and in 1859 Oregon was admitted to the Union as the thirty-third state. The state has a land area of 95,607 square miles, which is about the same size as New York and Pennsylvania combined, and three fourths the size of the state of Prussia. For administrative purposes the state is divided into thirty-four counties, and these in turn into three classes of school districts. In 1910 Oregon had a total population of 672,765, and a density of population of 7.0 persons per square mile. Omitting the city of Portland, which contains one third of the population of the state, the average density is only 4.9 per square mile.

Educational History. — First discovered in 1792 and first partially explored in 1805–1806; settlement did not begin until about 1835, but was relatively rapid after 1843. The first settlers were Hudson Bay Company employés, and private or mission schools supplied the needs of the few children at the trading posts. Beginning in 1834, the Methodist Episcopal Church began to found mission schools in the Territory, and they were joined by the American Board of Commissioners for Foreign Missions in 1836, by the Roman Catholics in 1841, by the Congregationalists in 1847, and by the Protestant Episcopal Church in 1869. When the first provisional government was established in 1845, it was declared that "schools and the means of education should be encouraged," but no funds to maintain a school were available, except subscriptions and mission appropriations. The first territorial legislature, in 1849, enacted the first school law for the Territory. This law appropriated the income from the school lands, together with all fines, forfeitures, and licenses, and the proceeds of a two-mill territorial tax to the support of common schools. This income was to be distributed among the school districts in existence on the basis of their school census. The law further provided for the organization of schools on the district system plan; the election annually of three directors to employ teachers, and to establish and care for the schools; the appointment of a county board of examiners of three, to examine and certificate teachers; the election of a county school commissioner in each county, to look after the interests of the schools; and for the choice by the legislature of a Territorial Superintendent of Common Schools, to supervise the educational system of the state. School directors were to hold office for one year, all other school officers for three years. In 1851, however, the state school tax was cut in half (restored to two mills in 1855), and the office of Territorial Superintendent was abolished. In 1885 the title of the county school officers was changed to county superintendent of schools; district school directors were empowered, on vote of the district school meeting, to levy a district school tax; teachers were first required to keep a school register, and to file it with the district clerk; district reports were required, or an appropriation of funds was refused; and schools receiving public funds were declared free to all children four to twenty-one years of age. For many years after this date, however, the rate bill (*q.v.*) was resorted to in order to prolong the term.

In 1857 a constitution was formed, and upon this the Territory entered the Union in 1859. This provided that all school-section land, the 500,000-acre grant to new states, and the

5 per cent fund (see NATIONAL GOVERNMENT AND EDUCATION) should be a sacred trust fund for common schools; that the lands given for a university should form a trust fund for that purpose; that for five years at least the Governor should act, *ex officio*, as State Superintendent of Public Instruction; that a county superintendent should be elected, for two-year terms, in each county; religious control and sectarian aid were forbidden; the legislature was directed to establish a uniform public school system and schools of higher grade, with a free school in every district for at least three months each year; the establishment of a state university with normal and agricultural departments was directed; and a Board of Commissioners, consisting of the Governor, the Secretary of State, and State Treasurer, was created to manage the school lands and school funds. In 1872, the five years having expired, the legislature elected a State Superintendent of Schools, detaching the office from that of Governor, and provided for the election of a Superintendent by the people in 1874, and every four years thereafter. This created the first unification of the schools under the new state organization, there having been practically as many school systems before as there were counties in the state. The same legislature further revised the school law and provided for a State Board of Education, to consist of the Governor, Secretary of State, and State Superintendent, this Board to have power to authorize a series of textbooks for the schools, and to adopt rules and regulations for their government. The State Board was also made, *ex officio*, a State Board of Examination, for the granting of state certificates and life diplomas. County superintendents were given enlarged functions, and the county school tax, previously authorized, was increased from two to three mills. Teachers' institutes were begun, the State Superintendent being authorized to hold one every year in each judicial district of the state. The state university was also founded in 1872 and located at Eugene, but it was not opened for instruction until 1876. At that time there were but twenty-two organized counties and but 642 school districts in the state.

The work of the State Superintendents for the next fifteen years consisted almost entirely in general supervision, in the developing and perfecting of statistical information, and in the organization of the teachers' institute work. The power given to the State Board of Education to make rules and regulations having the force of law was used to shape the slowly developing school system. Little school legislation of importance was enacted between 1872 and 1899. In 1874 a school for the blind was organized; in 1883 the normal school at Monmouth was placed under state control; and in 1885 the normal school at Weston was similarly accepted and given a small appropriation; in 1885 a separate agricultural and mechanical college was established at Corvallis, and the Department of Public Instruction was given the power to decide appeals on school law points; in 1887 the certification law was amended and strengthened, but in 1889 further amendments somewhat weakened the law; in 1889 an Arbor Day law and a defective compulsory education law were enacted; the State Teachers' Reading Circle was organized; a textbook law was enacted, under which the county superintendents were created an advisory body to adopt a series of uniform textbooks for the state; and the Oregon State Reform School at Salem was established; and in 1893 the textbook law was amended by adding the State Board of Education and the State Board of Examiners to the county superintendents, as the adopting body.

Beginning in 1899, a series of new and important laws began to be enacted, and the educational situation has been greatly changed and improved since that time. In 1899 the certification law was revised and strengthened, training in normal schools was recognized for certification, and the granting of state diplomas on mere experience was discontinued; a State Textbook Commission was created to take the place of the large and unwieldy body for the adoption of textbooks; the private normal schools at Ashland and Drain were accepted as additional state normal schools; a state course of study for the elementary schools, and examinations for graduation from the eighth grade were formulated by the State Board of Education; and the term of county superintendents was extended to four years, and educational qualifications were set up for the office. In 1901 a new revision of the school law was made, and the county high school law was enacted. In 1903 the consolidation of schools was permitted. In 1905 the "Pierce-Eddy law" requiring the county courts in every county to levy an annual county school tax of not less than $6 per school census child, four to twenty years of age, in place of the former five-mill tax, was passed, and this has materially aided in the development of better schools. In 1907 a revised course of study for elementary and high schools was issued; the high schools were classified; a school library law was passed; a State Library Commission was created; the compulsory education law was revised and strengthened, and provision made for truant officers; the minimum school term was raised from three to four months; an annual convention of district school officers by counties, and an annual convention of county superintendents, were provided for; the required county school tax was raised from $6 to $7 per capita; a schoolhouse flag law and a union school law were enacted; and a state institution for the feeble-minded was established. In 1909 county high school funds for tuition purposes were made possible; special certificates for high school teachers were required; the minimum school term was raised from four to six months; a new county school fund apportionment bill, providing for a minimum apportionment of $300 to each district was enacted; trustees were permitted to let schoolhouses for neighborhood gatherings; and a State Board of Higher Curricula, to unify the work of the State University and the State Agricultural College, was created. The legislature of 1909 also withdrew all aid from all of the normal schools of the state. Later, the matter of establishing one state normal school in place of the four was referred to the people and approved, and the legislature of 1911 created such a school and located it at Monmouth. The legislature of 1911 also abolished county teachers' certificates, and provided that all teachers' certificates should in the future be issued by the State Superintendent; provided for the recognition for teachers' certificates of graduation from standard normal schools and colleges; provided for teachers' training classes in four-year high schools; provided for additional county supervision in all counties having over sixty school districts; raised the county school tax from $7 to $8 per capita; provided for retirement funds for teachers in cities having over 10,000 school census children; and amended the union high school, the compulsory education, and the institute laws.

Present School System. — At the head of the school system of Oregon, as thus evolved, is a State Superintendent of Public Instruction, assisted by a number of state boards for special purposes. The Superintendent is elected by the people for four-year terms, and receives a salary of $3000 a year with $900 additional for traveling expenses. He is charged with the general supervision of the county and district school officers, and the general oversight of the school system of the state. He is required to visit each county annually, to attend the county institutes, and to inspect the schools. He may visit and inspect all chartered institutions. He furnishes all blanks used, collects and compiles statistics, edits the school laws, and prepares and submits a biennial report to the legislature. He holds an annual convention of the county superintendents of the state and an annual teachers' association meeting, and prepares and issues the State Teachers' Reading Circle course. He decides all appeals on school matters submitted to him, and may submit the decision to the State Board of Education if he sees fit. He issues all teachers' certificates for the state, on report of the State Board of Examiners, of which he is the official head; may issue special certificates in special subjects as he sees fit; and acts as Secretary of the State Board of Education, of which he is a member. He is also a member of the board for the standardization of normal schools and colleges, and of the Oregon Library Commission.

Oregon has a large number of state educational boards, each looking after some part of the state's educational system. The Standardization Board consists of the State Superintendent, the presidents of the State University, the Agricultural College, and the Normal School, the city superintendent of Portland, one member selected by the Independent College Presidents' Association, and one by the Catholic Educational Association of Oregon. Its purpose is to prepare lists of colleges and normal schools to be accepted as standard institutions for teachers' certificates. On the preparation of such a list by the U. S. Bureau of Education, the functions of this Board cease. The State Superintendent appoints the State Board of Examiners. This consists of nine professional teachers, who prepare the questions used, and such a number as is necessary to grade the answer papers. These two bodies constitute the State Board of Examiners, and the term of appointment is for two years. The State Superintendent is also authorized to appoint such clerical assistance as is necessary. The State Board of Education consists of the Governor, the Secretary of State, and the Superintendent of Public Instruction. Its chief power is the ability to make rules and regulations for the maintenance and discipline of the public schools of the state. It also approves of the adoptions made by the Textbook Commission, and promulgates the same; indicates the sources from which the questions on the theory and practice of teaching, in the examination of teachers, will be made up; and prescribes the course of study for the grammar, and first two high school grades of the public schools. The State Textbook Commission, appointed by the Governor, consists of five qualified persons, appointed for four-year terms. They advertise, examine the books submitted, and meet and select textbooks, for six-year periods, and submit the result of their labors to the State Board of Education for its approval. The Oregon Library Commission consists of the Governor, the State Superintendent, the President of the State University, the Librarian of the Library Association of Portland, and one person appointed, for a five-year term, by the Governor. The work of the board is to advise schools, libraries, associations, and communities as to the formation of libraries, and the purchase of library books; to purchase and operate traveling libraries; to conduct a summer library school; to prepare annual lists of suitable books for purchase; and to make rules and regulations as to library management. The Governor, the Secretary of State, and the State Treasurer constitute the State School-

Land Board, for the care of the school and university lands, and the proper investment of the income.

For each county there is a county superintendent of schools, elected by the people for four-year terms. Each must have had nine months' experience as a teacher, and must hold a first-grade teacher's certificate. The salary varies from $400 to $1800 a year, with $200 for traveling expenses. Each has general supervision of the schools of his county, must visit each at least once each year, and is authorized to secure the care and protection of the school property of the county. He apportions the school funds to the districts, requires monthly reports from the teachers and an annual report from the district officers, and makes an annual report to the State Superintendent. He also hears and determines all appeals on disputed school questions; keeps a record of all contracts; consults with the district directors with reference to schoolhouse plans, and must approve all building plans for third-class districts; holds an annual county teachers' institute; and may hold an annual convention of district school officers. He grants a diploma of graduation to all who pass the state eighth-grade examination, and may appoint four others to assist him, known as a county board of examiners, in grading the answer papers. For each county there is a district boundary board, consisting of the county superintendent and the county commissioners (county court, if no commissioners exist), which meets to consider all proposed changes in district boundary lines. This board may also condemn land for schoolhouse purposes, and appoint truant officers for the second and third class school districts of the county. For each county having sixty or more school districts, districts of the first class under superintendents excepted, the county superintendent must appoint four persons, for four-year terms, who, together with the superintendent, constitute a county educational board. It is the work of this board to divide the county into supervision districts, consisting of not less than twenty nor more than fifty school districts, and to employ supervisors for each of these supervisorial districts, except one, at salaries of from $1000 to $1200 and traveling expenses, for ten months' work. The county superintendent is designated as supervisor of one district. The county board acts as an advisory board to the county superintendent, and the district superintendents act under his direction and in his stead. Each supervisor must have had nine months' experience in teaching in the state, and must hold a state teacher's certificate.

Each county is divided by the district boundary board into a sufficient number of school districts, and these are divided into three classes. Districts having over 1000 children (cities) of school census age (four to twenty) are known as districts of the first class, and as such are given some important additional privileges; districts having from 200 to 1000 school census children (villages) are known as districts of the second class; and districts having less than 200 census children are known as districts of the third class. In second and third class districts, a district school board of three members is elected, one each year, for three-year terms, while in first-class districts, a board of five directors is elected, one each year, for five-year terms. Each board has a clerk, who exercises important functions. He is appointed by the board in first-class districts, and elected by the people in second and third class districts. The elections in all cases take place in June, and women may vote and hold office in school affairs. The annual meeting exists in second and third class districts, in a very modified form, its chief functions being the election of school officers (by ballot) and the voting of special taxes. The district clerk acts as secretary of the district boards, takes the school census, and preserves all records. He also has the custody of the district funds, and pays all orders drawn on the district, giving bonds for the safety of the funds in his charge. In first-class districts he exercises very important functions. Each board employs and contracts with its teachers, and may dismiss them for cause; has control of the school in all matters, except those relating to the course of study; may admit and exclude pupils; may loan textbooks to indigents; may furnish transportation, and may close the school and contract with another district to educate the children, when authorized by the voters to do so. In first and second class districts kindergartens may be established; first-class districts appoint their own attendance officers, and second-class districts may be permitted to do so; in second class districts the clerk may be appointed by the district board, if the district so votes; and in first-class districts the board may employ a city superintendent, prescribe the course of study and all rules and regulations, choose additional textbooks, create a city board of examination, provide evening schools and instruction in the modern languages, and may lease, build, and sell school property as it deems wise, and may contract indebtedness up to $100,000.

School Support. — When Oregon was organized as a territory in 1848, Congress directed that section 36, in addition to the usual grant of section 16, be reserved for the aid of common schools. On entering the Union, Oregon received two sections in each township, a total of 3,329,706 acres. The 5 per cent fund, the grant of 500,000 acres of land to new states, the swamp land grants (see NATIONAL GOVERNMENT AND EDUCATION), and the ten sections of the capitol building lands granted in 1859 were all added to the common school fund. The total fund is now nearly six millions of dollars, with 500,000 acres of land still on hand and not under lease. The income from this fund is small, and is apportioned to the counties and districts solely on the school census. No state tax is levied, the Oregon school system being financially a series of county school systems. The county court of each county must levy a county school tax equal to $8 per census child (four to twenty) in the county, and districts must levy a special district tax of at least five mills. The state and county fund is apportioned to the districts on the combined basis of $100 to each district as such, $5 for each teacher in the district who attended a teachers' institute the preceding year, and the balance on school census. If this apportionment, together with the five-mill district tax, does not equal $300, then the county must add enough from general county funds to raise it to this amount. High schools must be supported separately, unless an eight months' elementary school has first been maintained. Special county high school, high school tuition, and library taxes are levied, in addition to any needed county tax to provide $300 per year in every school district.

Teachers and Training. — The state employs about 4000 teachers, outside of the city of Portland, which employs about 750 more. For the training of future teachers, the state now maintains one normal school, at Monmouth. The high school training-class system has recently been introduced. All teachers' certificates are issued by the State Superintendent, and are valid anywhere in the state, except city certificates and temporary county permits. Any city of over 100,000 population (Portland) may appoint a city examining board and grant its own certificates, but state certificates must be accepted by the city, while city certificates are not valid elsewhere. Five kinds of state certificates are issued, — life, five-year state, five-year primary, one-year, and special certificates. The one-year certificates are renewable once; the others more than once. Graduates of high school training classes receive one-year certificates, and graduates of standard colleges and normal schools are granted certificates, if they have met the required conditions. All future high school teachers must be college graduates. A state teachers' reading circle, under the direction of the State Superintendent, has been organized recently, and no teacher (except in first-class districts) can have his or her certificate registered (by county superintendents) for the following year, who has not done the required reading. Any city having 10,000 school children may create a teachers' retirement fund, to which 1 per cent of the district's share of the county school tax is added annually.

Educational Conditions. — Oregon is essentially a rural and an agricultural state. Outside of the city of Portland, which contains 30.8 per cent of the people in the state, there is but one city of any consequence, and not many large towns. Away from the few lines of railway the population is quite sparse: 54.4 per cent of the population live in rural districts. Farming, timbering, stock raising, and the fruit-growing are the chief industries. Relative to its small population, the state is quite rich. In 1910, outside of the city of Portland, only 132,108 census children were reported in the 2265 school districts then existing, or an average of 52.7 children per district, while the average daily attendance was but 31 per district. As this included all towns and cities except Portland, it will be seen that there are, and must for a long time continue to be, hundreds of small districts scattered over the state. Though transportation of pupils, or the closing of a school and contracting with another to provide education, is permitted, the consolidation of small schools naturally makes but little headway.

The schools follow the state course of study, and are graded and classified. Uniform textbooks are adopted for the state for six-year periods, and districts are forbidden to use any others. The eighth-grade examinations have helped to create uniform state standards of work. The state library law and the state traveling libraries have made real headway in supplying the rural districts with good school libraries. Each county of less than 100,000 people must levy a county library tax of ten cents a school census child, to create a general county school library fund. This is apportioned to the districts on their school census, and must be used to purchase books from lists published by the State Library Board. A fairly good compulsory education law is in force, and provisions made for truant officers. But little has been done so far in agricultural education, though the beginnings of the movement are evident. The school term required now is six months, having recently been increased from three.

Secondary Education. — One hundred and eighteen high schools were reported in 1910, seventy-six of which were four-year schools. In 1875 there were but four. Any county may vote to create one or more county high schools; any district may create a high school, if it has sufficient funds to maintain its elementary schools eight months; and any union of districts may be formed to maintain a union high school. For county high schools, a county high school board, consisting of the county judge, two county commissioners, the county treasurer, and the county superintendent, manage the school and estimate and levy the necessary taxes. For union high school districts, boards of control are elected, with the same powers. Any county may also vote to create a county high school fund by taxation, sufficient to pay the high school tuition of all children in the county. For the first two years all high schools must follow the uniform high school course of study, issued by the State Board of Education, and must use the textbooks adopted by it. Any district may offer, by vote of the annual meeting, instruction in one or more grades above the eighth. Nearly all of the little towns have high schools, there being at least one in every county.

Higher and Special Education. — The State University (*q.v.*) at Eugene and the State Agricultural College at Corvallis stand as the culmination of the school system of the state. Until recently both of these institutions received but meager support from the state, and the state aid is still small. Considering their resources and the small population of the state, both institutions do good work. The state also has a number of small church colleges, nearly all of them old foundations, and only one of them having over $80,000 of endowment. All of these are open to both sexes. They are: —

College	Location	Founded	Control
Willamette University	Salem	1844	M.E.
Pacific University	Forest Grove	1853	Cong.
McMinnville College	McMinnville	1858	Bapt.
Albany College	Albany	1867	Presby.
Philomath College	Philomath	1867	U.B.
Pacific College	Newberg	1891	Friends
Dallas College	Dallas	1900	Un. Ev.

The state also maintains the Oregon School for Deaf Mutes, the Oregon Institution for the Blind, and the Oregon State Reform School, all at Salem. E. P. C.

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OREGON, UNIVERSITY OF. — A coeducational institution established by act of the State Legislature, 1871, and located at Eugene. It is placed under the control of a Board of Regents of thirteen members, ten of whom are appointive by the Governor. The other three members are the State Board of Education: the Governor, the Secretary of State, and the Superintendent of Public Instruction.

The university includes a graduate school; a college of literature, science, and the arts; courses preparatory to journalism, to law, and to medicine; a school of commerce; a college of engineering — including civil, electrical, railway, and chemical; a school of education; a summer school; a school of music; a school of law in Portland; and a school of medicine in Portland.

The requirements for admission to the freshman class comprise the completion of the usual four-year high school course. One hundred and twenty semester hours of college work, in addition to eight hours of physical training, are required for graduation. The work of the university is very largely elective.

The usual undergraduate degrees of A.B. and B.S. are given for four years of college work, and the graduate degrees of Engineer and of M.A. and M.S. on the completion of a year's additional graduate work.

The University of Oregon, as the State University, is an integral part of the state public school system. With the exception of the schools of medicine and law tuition is free. Support is derived almost wholly from the state. The university campus contains eighty acres of land, lying in the city limits of Eugene. Buildings are ten in number. The value of land and buildings is about $800,000. The total enrollment of students, January, 1912, was 1554. R. W. P.

ORESME, NICOLE, also known as OREM, HOREM, and HOREN (*c.* 1323–1382). — A French priest whose achievements and scholarship entitle him to rank as one of the great educators of his time. He entered the Collège de Navarre at Paris in 1348 as a student, and in due time became a professor there, and was later placed at the head of the institution. In 1377 he became Bishop of Lisieux, and held this position until his death. He translated various works on Aristotelian philosophy from the Latin into French, and was well known for his lectures on philosophy and mathematics. His *Tractatus de latitudinibus formarum* was very influential, and after printing was invented it appeared in several editions. He also wrote a *Tractatus proportionum*, which was printed at Venice in 1505. His most important work from the standpoint of mathematics, however, was the *Algorismus proportionum*, in which it clearly appears that he was the inventor of the fractional exponent now so commonly used in algebra. D. E. S.

ORGANIC MEMORY. — Whenever any organic tissue functions, it tends to change its structure as a result of its activity. The nervous system exhibits in a higher degree than any other of the organic tissues this susceptibility to experience. Whenever a portion of the nervous tissue has been used in the performance of any act, the structure of that part of the nervous tissue is so modified that it is easier for the act to be repeated at a later time. The ability of tissues to retain the results of past experiences is designated "organic memory." C. H. J.

See Habit; Memory.

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ORGANIC SENSATION. — All of the internal bodily organs, especially those in the abdomen, are supplied with sensory fibers. Any change in the condition of these organs, especially if it is pathological in character, arouses sensory processes. The sensations which result from such stimulations are especially important in determining the emotional background of experience. The ancients recognized this fact in their reference of emotions to the internal organs. In popular parlance we refer to the heart and other organs as seats of the emotions. How far the relations of the emotions to these organs are due to incoming currents of sensory stimulation, and how far they are due to the motor processes in these organs, may be a matter of discussion, but it is clear that the sensory experiences that arise from the internal organs contribute the general background of all conscious experience. Various classifications have been proposed for these organic sensations. Such classifications usually distinguish between the sensations arising from the different internal organs. It is to be noted, however, that the qualitative differences are not so important in this case as in the case of sensations coming from the external world. There is a very large element of pleasure or pain in the organic sensations. This fact appears in all of the discussions of the relations between these sensations and the emotions. C. H. J.

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ORGANISM. — See ENVIRONMENT AND ORGANISM.

ORGANIZATION OF CLASS WORK. — See SCHOOL MANAGEMENT.

ORGANIZATION, SCHOOL. — Every school system mediates between social needs and conditions and the physical and mental nature of childhood. The school as an institution serves the world and the individual; its adjustments are, therefore, at once sociological and psychological. Wherever the activity of the school system is primarily an arrangement determined by social ideals, public finance, and other distinctly social factors, we have an administrative method; wherever they primarily take into account the nature of the pupil and his growth, we have an educative or teaching method. Such methods are the means of executing the purposes of an institutional education. They are in large degree flexible, but underlying them is a more or less definite and somewhat fixed structural organization. Thus, behind administrative methods are the organized units of the school system, — kindergarten, elementary schools, high schools, colleges, universities; and behind the teaching process is a more or less definitely established course of study which is the basis of all teaching. Even the social order of a school and the discipline of its members rests upon a definite organization of rules, well-accepted customs, and habits of orderly procedure. It may be said, then, that the methods of a school may be differentiated into (1) its relatively fixed and static elements, and (2) its relatively flexible and dynamic elements. The former are included under the term "school organization"; the latter under "school methods," *i.e.* methods of administration, management, teaching, discipline, etc. H. S.

See SCHOOL MANAGEMENT.

ORIEL COLLEGE REFORMS. — See OXFORD UNIVERSITY.

ORIENTAL STUDIES. — **In Antiquity.** — The earliest actual impulse to the study of Oriental languages on the part of the West appears to have arisen in the natural desire for intercommunication on matters of mutual concern. From the remotest times trade and commerce had a paramount part in bringing this about, although it must also be emphasized that the factors of war and diplomacy played hardly less conspicuous rôles. As is well known, there had been business and political relations between Greece and the Orient long before the clash of arms between Hellas and Persia in the days of Darius and Xerxes; and the countermarch into the East by Alexander the Great a century and a half later was not without its commercial aspect.

International relations between Europe and Asia may be regarded as the source from which sprang the study of Oriental languages in the West. In some respects Themistocles, the political refugee from Athens to the Persian court of Artaxerxes I (460 B.C.), who in a year acquired sufficient fluency in Persian to be able to converse freely with the Oriental monarch without the medium of an interpreter, may be accounted a forerunner (Plutarch, *Them.*, 29); but the general attitude of the Greeks in considering everything that was not Hellenic to be "barbarian" was not favorable to the study of Eastern tongues.

On the other hand, the Orientals were far more liberal in their readiness to acquire a knowledge of foreign languages, and this position seems to have been maintained to the present day. The same freedom from a narrow linguistic point of view may have contributed materially to the readiness of Orientals to act as interpreters where other tongues are concerned. In Egypt royal encouragement was given to this attitude by Psammetichus, who recognized the practical ends in view and sent Egyptian children to a colony of Greeks and Carians in the Nile delta to learn Greek; and in this manner, according to Herodotus, arose the caste of

Egyptian interpreters whose services were employed by the Father of History himself, in his ignorance of the local tongue (*Hdt.*, 2. 154, 125). At a still earlier time the Median king Cyaxares is said to have sent children to live among his Scythian immigrants that they might learn the Scythian language (*ibid.*, 1. 73). A similar class of professional interpreters must have existed in Asia Minor, for Greek traders negotiated with Scythians on the Pontus Euxinus " through seven interpreters and seven tongues " (*ibid.*, 4. 24; cf. Arrian, *Anab.*, 4. 3. 7). When the Persian royal claimant, Cyrus the Younger, communicated with the Greek mercenaries in his army, it was through an interpreter as mediary (Xenophon, *Anab.*, 1. 2. 17); and the same was true of Xenophon in conferring with the Pontic Mossynœci (*ibid.*, 5. 4. 4). In India the Greek historian Onesicritus the Cynic, who accompanied Alexander the Great to the East, sought to interchange ideas with the Brahmans, though this was possible for him only through the aid of three interpreters; and as to the futility of endeavoring to expound Indian philosophy in such a manner, one of the Hindu sages justly remarked that to attempt it was to " expect water to flow pure through mud " (Strabo, p. 716).

Significant in this respect, as showing in later times the Oriental facility for the acquisition of foreign tongues, is the widespread use of the common word for " interpreter " derived from the Arabic *tarjumān*, " translator," which has given rise to a whole family of words like Italian *dragomanno, turcimanno*, French *dragoman, trucheman*, English *dragoman*, Old Church Slavic *tlŭmačĭ*, Middle High German *tolmetsche*, New High German *Dolmetsch*, Lithuanian *tùlkas*, and Dutch *tolk*, all signifying " interpreter."

With the growth of ancient civilization it was impossible for the West to rest content with a knowledge of Oriental languages merely for practical purposes, for some of these tongues possessed literatures of more or less merit, and the Greek mind craved to know what might be the contents of these " barbarian " books. We need give no special credence to an isolated Iranian tradition that one of the two original copies of the Avesta was translated into Greek at the command of Alexander the Great " as information which was connected with the ancients " (*Dīnkart*, 3. 5, tr. West, *Sacred Books of the East*, 37. p. xxxi.; cf. *ibid.*, 47. 82), although the Macedonian invader and the scholars who accompanied him may actually have interested themselves in knowing something about the famous Zoroastrian scriptures. We may pass a similar judgment on the allegation that the Alexandrine Peripatetic philosopher Hermippus translated 2,000,000 " verses composed by Zoroaster " (Pliny, *Hist. Nat.*, 30. 2. 1); indeed, it is not impossible that these two stories are in some way connected. At the same time, however, we must emphasize the fact that there were authentic cases of translation from Oriental languages into Greek and Latin. To the Greek group belong the translations of Berosus from the Babylonian by Philo Byblius, and Menander of Tyre from the Phœnician, and by Manetho from the Egyptian. All these works, which were historical in theme, have unfortunately vanished, except for scanty fragments; but it has recently been shown by Bezold and Boll (" Reflexe astrologischer Keilinschriften bei griechischen Schriftstellern," in *Sitzungsberichte der Heidelberger Akademie der Wissenschaften*, 1911, no. 7) that there was direct translation of extant Greek omen-literature from the Babylonian. In the Byzantine period there was considerable translating from Oriental languages (cf. Krumbacher, *Geschichte der byzantinischen Litteratur*, 2d ed., Munich, 1897), and we still possess a Greek version of the *Periplus* of the Carthaginian Hanno, which has recently been rendered into English by Schoff (Philadelphia, 1912).

The more practical Romans had the work of the Carthaginian Mago on agriculture translated into Latin at the command of the Senate; and Sallust mentions among his sources on African history some versions made for him from " the Punic books said to be those of King Hiempsal " (*De Bello Jugurth.*, 17).

When the Oriental religions began to permeate the West, the new need arose of a more precise understanding of their liturgies and sacred writings; and this necessity became still more urgent in the case of the demands made by Christianity, when the Western Church grew suspicious of the Septuagint rendering of the Bible (that earliest Greek version of an Oriental sacred book), and sought for a Latin version of the Scriptures which should be based on the original tongues. This demand was recognized as early as the third century A.D., when Origen prepared his *Hexapla*, with a presentation, as far as was then possible, of the Hebrew by the side of the other texts concerned. In the latter part of the fourth and the early part of the fifth century St. Jerome undertook the task of preparing the Latin Vulgate; and, to perform the work, he devoted himself for several years to the study of Hebrew, particularly among the Jews of Bethlehem.

Nevertheless, there is no trace, throughout this entire period, of the study of Oriental languages for other than purely utilitarian or religious ends. Though many of the authors who wrote in Greek were Orientals, — for example, Ptolemy and Plotinus were Egyptians, Porphyry and Iamblichus Syrians, Dioscorides a Cicilian, Galen a Mysian, Dio Chrysostom and Dio Cassius Bithynians, Lucian a Commagenian, and Strabo a Pontine; while for the Latin writers we may mention the Africans

Apuleius and St. Augustine, — these scholars have given us no glimpse of their native languages. Indeed, almost the only specimens of Oriental tongues extant in classical texts are the few lines of Punic in the *Pœnulus* of Plautus (ll. 930–949) and the line of Old Persian in the *Acharnians* (l. 100) of Aristophanes, for the unintelligible jumbles on Greek magic papyri are too uncertain to be considered here. There was, however, more or less knowledge of at least scattered words, as when Plato (*Cratylus*, 410 A) alludes to the resemblance between the Greek and the Phrygian designations for "fire," "water," "dog," etc.; and all this led to the compilation of glossaries, in which cognizance is taken of Oriental words, as in the one ascribed to Hesychius.

But at this very time a new force was gradually coming into being, destined to set at naught the exclusiveness of the Græco-Roman world with regard to the Orient. This force was Christianity, which sought to make the Scriptures accessible to all nations in their own languages; and for that reason missionaries were obliged to be able to expound the Bible and to preach in the vernaculars of those to whom they were sent. By the fifth century the Syrian bishop Theodoret could justly say, in his *De curandis Græcorum affectibus* (ed. Migne, *Patrologia Græca*, Vol. LXXXIII, p. 948), that the Bible had then been translated into Egyptian, Persian, Indian (*i.e.* South Arabic), Scythian, and Sauromatian, and many more, these including Armenian and, before long, Georgian. Apart from the Bible and except for theological literature, however, there was little effective activity in Oriental studies, although mention may be made of a brief glossary of ninety words in Armenian and Latin, belonging to the tenth century (ed. Carrière, Paris, 1886), as well as of the *Codex Cumanicus*, dating from the early fourteenth century (ed. Kuun, Budapest, 1880), which contains, besides a Latin-Persian-Cumanic glossary, a number of texts in the latter language.

After centuries of practical oblivion the study of Oriental languages showed signs of revival when, in 1259, Raymundus de Pennaforte urged the Dominican order to acquire Hebrew, while at the Council of Vienne (1311–1312) Clement V ordered the establishment of professorships of that language at all universities. For obvious reasons Hebrew long held the first place in Oriental studies, though Arabic, a knowledge of which was requisite for disputation with the Moors of Spain, also received attention. It was, however, Protestantism, with its insistence on the Bible only, that gave the great impetus to the study of Oriental tongues, though Protestantism had already been anticipated in a measure by the rationalism of the Renaissance, with its desire to delve deeply into all things secular. The first non-Oriental Hebrew grammar was prepared in 1506 by the distinguished Humanist Reuchlin (*q.v.*), who has justly been called the father of Jewish studies among the Christians; the earliest Arabic grammar was published by Pedro de Alcala in 1505 and ranks as one of the landmarks of Semitic philology. The first grammar of the cognate Ethiopic was issued by Marius Victorinus in 1548, and of Syriac by Johannes Albertus Wiedemanstatius in 1558; while in 1539 Theseus Ambrosius essayed comparative study in his *Introductio in Chaldaicam linguam, Syriam atque Armenicam et decem alias.*

During this period the progress of Semitic studies (see Jewish Education) was especially noteworthy, yet even Sanskrit received some attention in the sixteenth century from the Italian Philippo Sassetti, who lived in India from 1583 to 1588, and whose *Letters* (ed. Marucci, Florence, 1855) contain the earliest European information regarding this ancient language of India. It was, moreover, about the middle of this same century that the Jesuits established printing presses at Goa, and "Sanskrit, Tamil, Malayalam, and Syriac were studied by the Portuguese Jesuits residing there [at Ambalacatta] with great success" (see Burnell, "Early Printing in India," in *Indian Antiquary*, Vol. II, p. 90), while the first Tamil printed text, a Tamil translation of a Portuguese *Doctrina Christam*, appeared at Cochin in 1579. The transition from the more specific study of Semitic to that of Indo-Germanic had already been made by a Norman scholar named Guilielmus Postellus, who in 1538 devoted attention to Hebrew, Syriac, Samaritan, Arabic, Ethiopic, Georgian, and Armenian, besides a number of European languages, although he, of course, shared the prevailing theory that Hebrew was the parent of all languages. In yet another Oriental-Occidental field the famous Joseph Justus Scaliger published, in 1597, our earliest list of Gypsy words, as well as a brief specimen of the later Persian tongue.

The seventeenth century still further widened the knowledge of Oriental languages, and grammars or lexicons (or both) were prepared in a succession that is historically worth recording: Malay (1603), Turkish (1612), Tagalog (1613), Persian (1614), Canarese (1616), Armenian (1624), Georgian (1629), Coptic (1643), Congoese and Konkani (1659), Chinese (1667), and Amharic (1698), while in 1664 the Lutheran missionary, Heinrich Roth, learned Sanskrit in order to be able to dispute with the Brahmans, and late in the same century the famous Leibnitz made a determined attack on the old view that Hebrew was the ancestor of all languages.

In the eighteenth century, during which the first serious study of Oriental dialects was begun by Johann Joachim Schröder in his *Thesaurus linguæ Armeniæ antiquæ et hodier-*

næ, published in 1711, and when Oriental epigraphy was inaugurated in 1754 by Barthélemy in his investigation of the Palmyrene inscriptions, attention was devoted to the southern Indian dialects of Singhalese (1708) and Malayalam (1713), as well as to Tibetan (1722), Telugu (1728), the *lingua franca* of Hindustani (1741), Bengali (1743), Fanti and Akkra (1764), Chuvash (1769), Chermiss and Votyak (1775), Mahratta (1778), and Kurdish (1787).

The close of the eighteenth century was destined to see a discovery, to which reference has already been made, that was to revolutionize the entire outlook of Oriental studies, and that was fated, in the following century, when combined with the decipherment of the Old Persian inscriptions, to establish on a scientific basis the vast domain of Indo-European philology, as well as to give inspiration for the comparative study of Dravidian, African, and Polynesian languages. This was the opening to scholars of the West of a general knowledge of Sanskrit. Since that time the progress of Oriental studies has been fully assured as a branch of Occidental learning when conjoined with the other departments of Western and Eastern research to which allusion has been made above.

During the past generation or two the study of Oriental languages as one of the regular forms of educational training has received a recognized place in almost all the advanced institutions of learning in the Occident; and the Eastern tongues have been given a position in the curriculum side by side with the classic languages of antiquity and the modern vernaculars of Europe. From a pedagogical standpoint the value of Eastern studies is fully acknowledged, and their worth is more and more generally granted from the practical as well as from the cultural point of view. The reason for this is twofold. In the first place, the West is deeply indebted to the East for the contributions which the latter has made to our knowledge of antiquity. In the second place, Orient and Occident are more closely united to-day than ever before in history, and a mutual understanding of each other's storied past and of each other's present conditions — best gained through such special linguistic knowledge — is a potent factor in furthering the world's aims of civilization. Striking prominence has recently been given to the weight of this consideration through the rapid strides which Asia has lately made in the line of progress.

Oriental Studies in General. — As a science the study of Oriental languages is a relatively young development in the West, even though from the earliest times due recognition has been accorded to the practical knowledge of Eastern vernaculars. It was natural that the more special impetus to the movement should come first from a desire to study the Scriptures in the original languages as a requisite basis for true understanding of the Bible. Although the beginnings had been made in the days of the Church Fathers, it was only after the end of the Middle Ages that Christian scholars commenced to avail themselves more and more of the linguistic attainments of Jewish rabbis, and to gain through their instruction a more technical knowledge of the text of the Old Testament. (See JEWISH EDUCATION.) The establishment of a trilingual college for Latin, Greek, and Hebrew in 1516 at Louvain, Belgium, was but one of several kindred foundations on the continent of Europe and in Great Britain that were destined later to become great centers of Oriental learning. Hebrew, followed by Arabic, thus led the way to a broader study of the cognate Semitic languages, — a field that has been developed with special success during the last half century. In the line of Indo-Germanic philology, on the other hand, the introduction of a knowledge of Sanskrit, in the eighteenth century, was the most active agency in broadening the path that had long been trodden by Greek and Latin scholars; and the thoroughly scientific methods employed in Sanskrit philology were early accepted as models to be followed in other branches of Oriental research, especially in the entire domain of Indo-Germanic linguistics.

University instruction was not the only factor that played a part in promoting Oriental studies, for the mercantile and political relations which had been gradually developing between Europe, Asia, and Africa, especially after India was incorporated in the British Empire, were a prominent feature in this respect. Governments recognized the value of giving financial aid to special seminaries which had for their object the training of young men for commercial and diplomatic service in the Orient. One of the earliest of these institutions was the *Kaiserliche-Königliche Konsular-Akademie*, founded at Vienna in 1754 by the Austrian government, and of like purpose was the establishment of the *École spéciale des langues orientales vivantes* at Paris in 1795, while mention should also be made of the still older *Reale Instituto orientale* founded at Naples in 1727. Later developments along corresponding lines are the *Lehranstalt für orientalische Sprachen*, organized at Vienna in 1851; the creation of an extensive corps of special instructors for Oriental languages in connection with the work of the University of St. Petersburg since 1854; the ministerial subsidies devoted to the *Seminar für orientalische Sprachen* at Berlin since 1887; and the establishment of the *Orientalische Handelsakademie* at Budapest in 1891. In England the University of London likewise includes a special School of Modern Oriental Languages; and Oxford and Cambridge each have chairs or lectureships for a score and more of Oriental specialists, with kindred representatives in all the other universities of Great Britain. Throughout the continent of Europe every university is equipped proportionately, or even in much larger degree. Nor has North America been far behind since the time when the real foundation for Asiatic studies in the New World was laid, more than half a century ago, by the noted Sanskritist, William Dwight Whitney, of Yale, who died in 1894. In South America, on the other hand, the serious study of Oriental languages is still to be inaugurated.

Hand in hand with the several movements already described there has gone also the strong impulse imparted by the work of the learned societies whose special aim is devotion to various lines of Oriental research. One of the earliest of these bodies was the Asiatic Society established at Calcutta in 1784; while to-day there is a flourishing Oriental society in nearly every country of Europe, and North America can likewise claim its own Oriental Society, founded in 1842. Among the most important of the European societies are the English Royal Asiatic Society of Great Britain and Ireland (founded in 1834), with its daughter societies — the Bombay, Ceylon, China, Korea, and Straits Branches; the German *Deutsche morgenländische Gesellschaft* (1845), *Deutsche Orient-Gesellschaft* (1898), *Vorderasiatische Gesellschaft* (1895), and *Münchner orientalische Gesellschaft* (1901); the Dutch *Koninklijk Instituut voor de Taal-, Land- en Volkenkunde van Nederlandsch Indië* (1851); the French *Société asiatique* (1822); and the Italian *Società asiatica italiana* (1887). These societies all publish their own journals, and among other periodicals relating to Oriental languages may be noted the English *Journal of the African Society*; the East Indian *Indian Antiquary*; the *American Journal of Semitic Languages and Literatures*; the Belgian *Muséon*; the German *Zeitschrift für Assyriologie, Zeitschrift für ägyptische Sprach- und Altertumskunde, Zeitschrift für afrikanische, ozeanische und ostasiatische Sprachen, Archiv für das Studium deutscher Kolonialsprachen*; the Austrian *Wiener Zeitschrift für die Kunde des Morgenlandes*; the Swedish *Sphinx*; the French *Revue sémitique, Recueil de travaux relatifs à la philologie et à l'archéologie égyptienne et assyrienne, Revue d'assyriologie*, and *T'oung Pao*; and the Italian *Studi italiani di filologia indo-iranica, Oriens Christianus*, and *Bessarione*.

As this survey implies, the breadth and scope of the studies pursued have grown in a remarkable manner during the last fifty years. The day is past when either Sanskrit or Hebrew and Arabic, or any other single one of the two great linguistic families to which they belong, can claim the priority of attention which they once enjoyed. A place is now found beside them for the study of the Chinese classics, for questions relating to Japanese, for Central Asian dialects, Philippine tongues, African vernaculars, and Polynesian speech forms. The East itself, which had long been obliged to cultivate European tongues for practical reasons, is now devoting serious attention to its own individual languages as a subject worthy of profound consideration. The Asiatic Society of Japan was founded at Tokio in 1872, and the Siam Society at Bangkok in 1904; though to foreign initiative are due the establishment of the *École française d'extrême orient* at Hanoi in 1898 and of the *Vostočnyi institut* (" Oriental Institute ") at Vladivostok in 1899.

The Practical Value of Oriental Studies. — The practical value of a training in Oriental languages will be self-evident for the claims made upon the missionary, diplomat, military officer, or merchant who is to live among the peoples speaking those tongues. Even though in many places English or French may serve as a medium of communication sufficiently well to answer ordinary requirements, nevertheless when once the Westerner leaves the beaten track, he will be practically helpless without a knowledge of the vernaculars or of the *lingua franca*, which may be Arabic, Persian, or some other Oriental language. While for the merchant or the military officer in the East it may be enough to learn merely the modern spoken languages or dialects, precisely as the ordinary man in rank and file or at the desk acquires a speaking knowledge of French, German, or Spanish, it is incumbent on the missionary and the diplomat in the Orient to know also the ancient Eastern languages and their literatures. The religious and secular life of a people can be studied accurately only in the light of a thorough knowledge of their past history and literature; and this fact equally presupposes a knowledge of their language from its earliest accessible period. No translation, however skillful, can suffice, and for the Oriental field in particular the task of the translator is beset with innumerable perils. If the trained investigator often stands perplexed before some apparently absurd, cruel, or obscene custom of the particular people with whom he is brought in contact, how much more helpless must he be who has had no real scientific training, yet who recognizes that effectively to remove the evil he must first recognize and eradicate its cause. To this lack of training on the part of those who have sought to spread the Gospel, many of the criticisms of the older school of missionaries are due; on the other hand, those missionaries who have best understood their people have almost invariably been the ones who have had the greatest success both in winning converts and in every other respect. To the theologian Oriental studies make a special appeal, for the light that is cast upon the language and the religion of the Old Testament from the Semitic tongues, religions, literatures, and customs is incalculable. To the teacher of languages or of literatures some Oriental study is essential if he is to do his best work. Sanskrit holds in this respect the first place as the oldest member of the Indo-Germanic group of languages; and its grammar explains phenomena in other tongues that are otherwise inexplicable. In fact, it is even more essential in this respect than even Greek and Latin. If the specialist in Church history and in the history of dogma must be familiar with Oriental languages, it is none the less true that the historian of philosophy must be equally familiar with the thought of the East; and in like manner the historian not only of such sciences as mathematics, chemistry, and medicine, but also of certain periods and countries of Europe must seek Oriental sources, as for the history of the Crusades or of Spain, Greece, and Malta. Finally, no survey of literature is complete without some knowledge of the literary types found in Sanskrit and Pali, Syriac and Arabic, Chinese and Japanese, Persian and Egyptian.

Oriental Studies and their Educational Pursuit. — The difficulties of Oriental study are exaggerated in the popular mind. This is probably due in great part to the fact that they are written in unfamiliar scripts. Yet inherently these tongues are not really hard to master, and the grammar of the Semitic and of most of the Indo-Germanic Oriental languages is comparatively easy. The only real difficulty is in the vocabulary. The teaching of Oriental languages will probably never begin before Junior year in college, although there is no real ground for making this limitation beyond the fact of the insistent demand of studies that are seemingly more urgent and the fact that Orientalism will attract only a chosen few. Grammars, lexicons, and chrestomathies exist in abundance for all the better known tongues, and only in the verb categories of Semitic will the average beginner find anything that is really unfamiliar to him. A knowledge of classics is usually possessed by those who take up Oriental studies. Although such knowledge is not an indispensable prerequisite, and although it may even occasionally be questioned whether some of the students who undertake the study may not approach it more independently without a technical familiarity with Greek and Latin; yet teachers, on the whole, have thus far in the West found their best adapted scholars among those who have previously been equipped with the essentials of one or both of the classic tongues. To the student who perseveres there is a vast field where he can scarcely fail to reap some fruit, particularly as in almost every Oriental language there are large bodies of literature as yet only inadequately known, or even entirely uninvestigated, in many cases not even edited.

The one real difficulty is that there is, under present conditions, a lack of teaching positions for Oriental languages, except perhaps in the Semitic field; and the hope is to be cherished that larger opportunities may be opened, as are due, to scholars who devote themselves to this branch of research. On the other hand, it can scarcely fail to make for mental poise and the avoidance of the peril of overspecialization if one has some Oriental subject for his diversion, if not for his domain of special study and investigation.

There is, however, a word of warning to be sounded in regard to what may be called pseudo-Orientalism. The tendency to seek for novelty and for superficial analogy has been prejudicial to the cause of true Eastern studies, especially in view of the close connection of much of Oriental literature with religion. Astro-mythological theorists, for example, and the "pan-Babylonians" have brought some branches of Semitic studies into critical discredit; while pseudo-Buddhists and other imperfectly informed followers of Oriental systems of thought have at times detracted from appreciation of the true value of Sanskrit and Pali studies. Lack of genuine knowledge has prevailed somewhat widely, it must be confessed by the competent critic, and has led too many of the weaker minds astray. There is, then, all the more reason for the sober and scientific study of Oriental languages and for the teaching of these disciplines in a manner that shall adequately set forth their true dignity and their true worth. A. V. W. J. and L. H. G.

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ORIENTATION OF THE SCHOOLHOUSE. — See ARCHITECTURE, SCHOOL.

ORIGEN (185–254). — The greatest of all the early Christian teachers was an Egyptian, the son of Leonides, a teacher of rhetoric, who gave him a liberal education in all the arts and sciences then known. He was a precocious scholar, a pupil of Clement of Alexandria (*q.v.*)

and of Ammonius Saccas, the founder of the Neo-Platonic Philosophy. He became thoroughly familiar with the teachings of Plato and all the Greek philosophers and with the Hebrew Scriptures. At the early age of eighteen he was placed at the head of the great Alexandrian School (see CATECHETICAL SCHOOLS). Here his activity as a teacher and writer was incessant, and by his untiring industry and irresistible logic he soon won the title of *Adamantius.* His fame spread far and wide, and he was consulted by scholars, statesmen, and leaders of the Church, with whom his opinions carried great weight. Under his direction the Alexandrian School became the greatest center of learning in the world.

In the persecution under Maximia, Origen was driven from Alexandria and found refuge in Cæsarea, where he established a new Catechetical School (*q.v.*), which soon surpassed that of Alexandria. Here he passed the rest of his life in prodigious labors. The opinion of the learned men of Palestine was voiced by Gregory of Nyssa (*q.v.*), who described him as "the Prince of Christian learning in the third century." Fortunately we have a contemporary record of his educational methods by Gregory Thaumaturgus (*q.v.*), who was his pupil for five years at Cæsarea. His *Panegyric upon Origen* is one of the classics of education and gives us a vivid picture of this great educator and his work. The system as described by him was remarkable for its breadth, thoroughness, and high moral tone. The first stage consisted of a careful training in grammar and logic, designed to teach the student the exact meaning and use of words and to enable him to investigate truth and detect false arguments. He was then introduced to the study of the physical world through the sciences of physics, astronomy, and geometry. Next came the study of ethics, based upon the four Platonic virtues and including an examination of all known ethical systems, in order to incorporate everything of permanent value found in them. The object, however, was not so much to formulate a theory of ethics as to build up character. Gregory's words are significant: "Much as we learned from the words of Origen, we learned still more from his example." Evidently there was a peculiar charm about this great teacher which endeared him to his students, while his pure and noble character impressed them not less than his intellectual powers. His whole educational system culminated in the study of Holy Scripture, to the exposition of which he devoted his highest powers. His literary labors were enormous. St. Jerome (*q.v.*) says he wrote 2000 books. In his *Hexapla* he brought together in one polyglot collection the best versions then extant of the Old Testament. His *First Principles* was the first attempt ever made to create, with the help of philosophy, a science of Christian Doctrine and was one of the most influential books ever written, although disfigured by some extravagant speculations. His *Commentaries* and *Homilies* upon Holy Scripture, of which only a few remain, were voluminous and valuable. His apologetic work, *Contra Celsum,* his *Stromata,* in which he compares the doctrines of Christianity with the teachings of philosophy, and his *Letters* complete the list. W. R.

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ORIGINAL AND ACQUIRED CHARACTERISTICS. — See ACQUIRED CHARACTERISTICS; NATIVISM.

OROSIUS, PAULUS (*fl.* 415). — Historian and theologian, a native of Spain. Of his life little is known before the barbarian invasions of Spain, about 409. Soon after this he came into personal relations with St. Augustine (*q.v.*), whom he represented rather unsuccessfully when Augustine sought to procure the condemnation of Pelagianism in Palestine. In 417–418 Orosius was back in Hippo with St. Augustine. At this time he wrote his famous history, *Historiarum adversus paganos libri septem.* It was undertaken in proof of a position assumed by Augustine in his *City of God,* rather than with a purely historical purpose. Orosius aims to prove by an outline of general history that before the advent of Christianity the world suffered even more from plagues, pestilences, famines, wars, and other disasters than since that event. In this historical sketch, Orosius meets successfully the pagan charge that the introduction of Christianity and the cessation of heathen worship were the causes of the recent disasters to the Roman world. Orosius made use of the Old and New Testament, Josephus, Eusebius, and also Livy, Tacitus, Suetonius, Cæsar, Cicero, and other pagan historians. In turn the work was used by Bede and medieval writers generally. As an independent authority, Orosius is of importance only in the latter part of his work, from about A.D. 378 to the end A.D. 417. The book was translated rather freely into Anglo-Saxon by Alfred the Great, and its popularity in the Middle Ages was very great, serving as the accepted manual or textbook of general history. The other works of

Orosius are theological in character and connected with the controversies of his time.

J. C. A. Jr.

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ORPHANS, EDUCATION OF. — The term applied to the institutions now generally termed orphan asylums, orphanages, or orphan houses or schools, was hospitals; and under the caption Hospital Schools the historic development of these institutions and of this type of education has been traced. Following the Reformation such institutions, more or less independent of the Church and replacing the old ecclesiastical foundations which had the care of orphans as one of their functions, became quite numerous. Especially with the seventeenth century was there a marked development which, to the present day, has given a distinctive place to this type of educational institution. A brief historical sketch outlining the details given under Hospital Schools will furnish a perspective for judging present conditions; see also Pictism; Francke; etc.

Historical. — The earliest expression of charity in human society of which we have any record was exercised in behalf of orphan children. The Hebrew Scriptures in most emphatic terms repeatedly enjoined responsibility for the care of the widow and the orphan: " Ye shall not afflict any widow or fatherless child. If thou afflict them in any wise and they shall cry at all unto me, I will surely hear their cry, and my wrath shall wax hot and I will kill you with the sword; and your wives shall be widows and your children fatherless" (Exod. xxii, 22–24). " And the Levite (because he hath no part nor inheritance with thee) and the stranger, and the fatherless, and the widow, which are within thy gates, shall come, and shall eat and be satisfied; that the Lord thy God may bless thee in all the work of thine hand which thou doest." (Deut. xiv, 29.)

Nearly two thousand years later a New Testament writer defined religion in terms of charitable service rendered the widow and the fatherless: " Pure religion and undefiled before God and the Father is this, to visit the fatherless and widows in their affiiction and to keep himself unspotted from the world." In the Apostolic constitutions of the primitive churches bishops were commanded " to take care of the orphans; see that they want nothing." (See Chastel's *Charity of the Primitive Churches.*) Throughout the Middle Ages endeavor in behalf of orphan and dependent children was under the direction of the Church. The Emperor Constantine after his conversion from Paganism to Christianity declared himself the patron of orphans and other defenseless children.

The modern orphan asylum as a charitable institution maintained apart from church or monastery arose in the latter part of the seventeenth century. The best known of those early asylums was the one established in 1695 in Halle, Germany, by August Hermann Francke (*q.v.*). It was opened on the goodly capital of three and one half dollars. On finding this sum at one time in the contribution box which he had fastened up in his house, Francke exclaimed, " With this must I do a great work." With such small beginnings he began to gather in, to feed, and to instruct orphans and street beggars. Later he began to build, adding structure upon structure as the numbers increased. His establishment still remains — a quarter of a mile in length and six stories high, built around a long courtyard. Francke's orphanage and home for dependent children became the model and inspiration of many others established during the following century in Germany and other countries, including the United States. In his *Annual Report* as Secretary of the Board of Education of Massachusetts, Horace Mann (*q.v.*) in writing of his visit to the German States says, " Another fact which will strike the visitor to these countries (German States) with mingled sorrow and joy, is the number and populousness of their orphan establishments. In the great cities almost without exception, one or more of these is to be found." The orphan houses originally established for the care of soldiers' orphans were afterwards appropriated to orphans of other classes. Institutions established in the United States after the Civil War for soldiers' orphans have in recent years followed a similiar course, in some states becoming state industrial schools for dependent and delinquent children.

In some of the orphanages of European countries the training given the children of soldiers and sailors was intended to fit the boys for the occupation of their fathers. Thus in the same *Report* quoted above the writer says: " In the Royal Orphanage House at Potsdam there were a thousand boys all children of soldiers. Great attention was given to physical training. As the boys were destined for the army it was thought important to give them agility and vigor. The boys practiced gymnasium exercises, such as climbing poles, ascending ropes, flinging their bodies round and round over a bar while they hold on only by the bend of the legs at the knee joints, vaulting upon the wooden horse, etc., until their physical feats reached a point of perfection which I have never seen surpassed except by professional circus riders and rope dancers." At Brest was a similar institution for sailors' orphans which gave a special nautical and military education, including management of sails, fife, drum, rowing, swimming, whistling, gun practice, boxing, etc. (Barnard *American Journal of Education*, Vol. XXI, 378–80.) This program of training is still in vogue in similar institutions, as illustrated recently by the coronation drill exercises in honor of George V rendered by the boys of the Reedham Soldiers' Orphan Asylum, Purley, which is directly under His Majesty's patronage.

In the early period of this country orphan and dependent children were cared for in public almshouses, where they were usually housed with the adult paupers. (See Poor Law and Education.) Their removal from these institutions beginning about the middle of the last century has been a long and tedious process and is not yet entirely accomplished. (Folks, *The Care of Destitute, Neglected, and Delinquent Children.*)

Parallel with this movement, but more rapid in progress, has been the founding of orphan asylums.

Prior to 1801 only six orphan asylums had been founded in the United States. By 1831 fifteen more had been established. After 1831, their number increased rapidly. During the twenty years following 1831 fifty-six orphanages and homes for destitute children were founded. "It is not possible to trace the establishment of children's institutions after 1850 in detail. It may be stated that everywhere they increased in numbers and in diversity of character and objects. Not including some Central and Western states from which returns have not been received, forty-seven new constitutions were organized in the fifties, seventy-nine in the sixties (notwithstanding the civil war) and twenty-one in the first half of the seventies." (Folks, *l.c.*)

Present Conditions. — The latest report of the U. S. Bureau of the Census of Institutions gives forty-four hundred as the total number of benevolent institutions in the United States. Of this number eleven hundred are orphanages and children's homes. These are broadly classified as public, private, and ecclesiastical. In round numbers there are five hundred private, an equal number of ecclesiastical, and one hundred public. The total number of children in these institutions is about one hundred thousand and the average expense of maintenance ten millions of dollars. New York ranks first among all of the states in both the number and proportion to population of children's homes having one hundred and fifty of these institutions. Of this number only five are public homes, while the remainder are divided about equally between private and ecclesiastical foundations. Twenty-six states have no public institutions for children. Whether a state has many or few orphanages does not depend upon the population or the number of dependent children, but rather on the policy pursued in caring for them. If an institutional policy has prevailed, there will be many institutions; if a placing-out method of care, — that is, the placing of the dependent child in private homes at board, at service, or by adoption, — there will be few institutions. Thus, Iowa with a population of two and a quarter millions reports but twelve institutions, while New Jersey with a population of half a million less reports forty-six homes.

The number of orphanages and children's homes has increased rapidly for the past twenty-five years. From 1890 to 1903 the total number of new homes opened was about four hundred. Many of them, especially those established upon ecclesiastical foundations, have had their origin in religious or sentimental impulse rather than from a clear recognition of the need of such a charity. The result of this blind philanthropic endeavor has in some instances been an over-planting of institutions on the one hand and indiscriminate charitable relief on the other, as shown in the admission of many children whose separation from their homes was merely an economic convenience rather than a necessity.

Systems of Organization. — There are two types of orphan homes — the congregate or barracks type and what is known as the cottage system. In the congregate homes the children live in one large building, which contains kitchen, dining room, dormitories, playroom and schoolrooms. In the cottage system the children of the institution are divided into small groups of from fifteen to twenty-five, each group having its own cottage home. There are several modifications of this form of housing from the completely separate and individual cottage home and school to that in which the school, kitchen and dining room are in central buildings, the separate cottages providing dormitories and perhaps sitting rooms for the various groups. Since the advantage of the cottage plan over the congregate lies in its nearer approach to the private family home, it follows that central features for a group of cottages like the kitchen or dining room, where all of the children assemble three times a day, are opposed to the chief aim sought in adopting the family-group idea. In a well-managed cottage system the kitchen and dining room in each cottage become practical training schools in which the children learn to manage a range, to cook, prepare and serve meals, with all of the innumerable accessory duties and responsibilities pertaining thereto. The cottage sitting room and library contribute in a similar way to the home life and spirit. A sense of mutual dependence and family interest pervades the cottage group. This under wise direction by the head of the cottage develops into an *esprit de corps*, which is the strongest factor in the cottage system.

In a central kitchen all of this is wanting.

Since everything must be done on such a large scale, the food supplies, utensils, cookers, range fixtures, etc., are so heavy that but little opportunity is afforded for the training of children in such a kitchen. As to the food, quantity rather than quality is the factor most in evidence. Refinements of the culinary art are wanting. There is an absence of variety. There can be no catering to individual or group tastes. Such a kitchen cannot serve as a school. In the immense dining rooms of such institutions the children do not partake of their meals with refined table manners and social intercourse — they are simply fed.

Education. — The education of orphans and dependent children in institution homes up to within very recent years has been so meager that but little can be said in its favor. Many of those established by the various religious denominations have been administered along narrow sectarian lines. Children are retained until twelve or fourteen years of age and then either returned to relatives or placed out in family homes, where they become in most instances the unpaid servant of the household.

Most of the orphanages have maintained their own schools and in these the teachers and instruction are inferior to the standards of the public elementary schools. The teachers are usually required to perform other services in the institution in addition to the work of teaching. The course of study leads nowhere and there is no higher school beyond the institution school to awaken an ambition for promotion. Rarely have the children in such homes passed beyond the elementary grades while remaining in the institution. After their release to relatives or private homes, subsequent school attendance becomes desultory or is entirely abandoned. This has been the experience of scores of thousands of orphans and dependent children. As conceived by most of the managers of homes for dependent children, charity was to go no further than was necessary to enable the child to earn his keep when placed in a family home. The uncertain and transitory period of his stay in the institution made school attendance largely a matter of marking time rather than an experience of purposeful effort. The more recent and enlightened view, however, regards makeshift school attendance and such early exploitation of child life as not only an individual but a social waste. Much more extended educational advantages are, therefore, now being provided by the more progressive institutions in this country. A few of the better class are sending their wards to the public schools, and children of educational promise are given an opportunity to pursue secondary and in some cases even higher educational courses. There has also been great progress in education along industrial lines. Some of the institutions now provide special teachers in manual training, cooking, dressmaking, etc. The institution's own needs in these fields of instruction give a much more practical turn to the work than is possible in public school instruction. Thus, in the sewing and dressmaking classes the girls repair and make garments for themselves and other children. In the manual training classes the boys repair and make new furniture, toys, play apparatus, and implements for their own use in work about the place. In the garden and poultry classes they raise vegetables and poultry for their own tables, and the cooking classes frequently prepare the regular meals of the cottages.

Since the institution furnishes not only the school, but also the child's home life and environment, it is possible through correlation to bring these two into very close touch in the classroom. The everyday interests and activities of the child may not only interpret the subject matter of the classroom, but may also furnish much of the educative material itself. The course of study may be adapted at every turn to the experience and interests of the child. Every important event or development in the life of the home, plowing, planting, cutting down trees and sawing them into lumber and cord wood, starting and running incubators and brooders, buying and selling, building and paving, incidents and accidents, — all are fraught with educative stuff.

There is another important aspect in which the institution school can adjust itself to the needs of the child and where the public school fails to meet a condition. As children move upward through the grades the subject matter of instruction grows more and more abstract, while the child in the earlier years of the adolescent period, the years of physical stress and rush, unless naturally studious or academic in his tastes, yearns for concrete experience, for action, for industrial work, economic gain, and freedom from physical restraint. In the institution he may give half of each day to industrial work and the other half to school work, thus preserving a balance that may tide the child over a restless period of a year or two and still preserve and keep alive and going those academic interests which ordinarily are lost forever to the pupil that drops out of the public school during this period.

But most of the institutions of the country have not risen to their educational opportunities. The above conception of education is realized in but few of the more progressive ones. Many of them, however, are in a state of transition. They are moving from urban to rural locations and changing from congregate to cottage systems of housing. Along with these changes improvement in educational standards and methods is keeping pace. Hitherto this progress in education has been greatly retarded by the fact that they have been regarded as homes rather than schools. Since the meaning of childhood is gradually being interpreted more and more in terms of education, institution life is passing into a renaissance of higher training, intellectual, industrial, and social. R. R. R.

See Childhood, Legislation for the Conservation and Protection of; Poor Law and Education; Charity Schools; Ragged Schools; Rauhes Haus, etc.

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ORR, GUSTAVUS ADOLPHUS (1819–1887). — State Superintendent of Schools; was educated in private schools, at the University of Georgia, and at Emory College, graduating at the latter in 1844. He taught in Georgia and Tennessee from 1845 to 1849; was instructor and professor in Emory College from 1849 to 1867; was president of the Southern Female Masonic College from 1867 to 1871; one year professor in Oglethorpe University; and from 1872 to his death in 1887, he was State Commissioner of the Schools of Georgia. He is called the father of the common school system of Georgia. W. S. M.

ORTHOGRAPHY. — See Spelling.

ORTHOPEDIC INVESTIGATIONS AMONG SCHOOL CHILDREN. — See Crippled Children, Education of; Spinal Curvature; etc.

ORTON, JAMES (1830–1877). — Scientist and college professor; was graduated from Williams College in 1855, and from the Andover Theological Seminary in 1858, after which he traveled and studied in Europe. He was for several years pastor of a Congregational church. From 1866 to 1869 he was professor of biological science in the University of Rochester, and from 1869 to the time of his death at Vassar College. He conducted several scientific expeditions to the high Andes, and met his death on such an expedition at Lake Titicaca. Besides numerous scientific works, his publications include *The Liberal Education of Women* (1873) and *Comparative Zoölogy* (1875). W. S. M.

OSORIO (DA FONSECA), JERONIMO (1506–1580). — Bishop of Silves in Portugal; studied in the universities of Salamanca, Paris, and Bologna, and became Professor of Divinity at Coimbra (*q.v.*). Osorio is called the Cicero of Portugal. One of Osorio's treatises, the *De Gloria,* was thought by some of his contemporaries to have been a lost work of Cicero, found and published by Osorio. Osorio's chief educational work was the *De Regis Institutione et Disciplina, Libri VIII* (Coloniæ Agrippinæ, 1572). It is a book of great length, praising the seven liberal arts, grammar, dialectic, and rhetoric, with arithmetic, music, geometry, and astronomy, all of which a true king will well know. But more urgently still are the moral virtues of a king extolled — prudence, wisdom, temperance, justice, magnanimity, and so on. Osorio is praised because he writes in a series of reasonings rather than grounds himself mainly on quotations, a method common in his time. Roger Ascham (*q.v.*) speaks in his praise (see *Scholemaster,* pp. 129–131. Mayor's ed., 1863). F. W.

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OSWEGO MOVEMENT. — A systematic attempt, radiating from the State Normal School at Oswego, N.Y., to introduce the best features of Pestalozzianism into the schools of this country. The spirit of the movement was inseparably bound up in the life of its founder, Dr. Edward Austin Sheldon (*q.v.*). Like Pestalozzi, Dr. Sheldon was first led to take an interest in education by observing the condition of the poor children of Oswego. As early as 1848 he had organized a school for them and was trying in various ways to ameliorate their condition. After this philanthropic experiment, Dr. Sheldon spent nine years in public school supervision, first at Syracuse and later at Oswego. The result of his experience was a deepening conviction that not only had we failed to give universal education, but that the methods of teaching then in vogue were unscientific and the course of study was too narrow and formal. He then resolved to devote himself to the reform of education, which proved to be his lifework.

Dr. Sheldon saw clearly that the first step toward bettering the schools was to secure better-trained teachers. To this end for a time he carried on Saturday classes for teachers at Oswego and gave instruction in the principles of teaching. In order to supplement with practical work, the school board of Oswego coöperated in establishing a city training school, selecting a sufficient number of their public schools to be used as model or practice schools. In the same year (1861) Miss Margaret E. M. Jones was persuaded to come from London to teach in the new school. Miss Jones had taught for fifteen years in the Home and Colonial Training School. (See HOME AND COLONIAL SCHOOL SOCIETY.) Miss Jones remained at Oswego only one year, but that served to place upon a firm footing the essential ideas of the great Swiss reformer. The object-teaching phase of his work seems to have appealed strongly to his English followers, and as might have been expected, Miss Jones emphasized object lessons as a separate branch. But it should be noted that Dr. Sheldon had been previously much impressed with the large collection of objects in the Educational Museum of Toronto. The idea of this collection was borrowed from English reformers. The responsibility for the spread of object teaching must also be shared with N. A. Calkins, who was a pioneer in this movement.

After Miss Jones withdrew from Oswego, Dr. Sheldon had the good fortune to secure the services of Herman Krüsi, Jr. (*q.v.*), the son of Pestalozzi's most famous assistant. His entrance into the Oswego group helped to call public attention to this new center of educational reform. Of the other teachers whose devotion helped to make the Oswego work a distinctive movement, Dr. Sheldon's daughter, Mary (the wife of Professor Earl Barnes), must be named. Her well-known methods of introducing children to the study of history by beginning with the sense phases of local history is a practical and valuable application of Pestalozzi's maxims.

The work done at the city training school at Oswego was so radically different from the general routine that it soon roused the active criticism of those who honestly investigate new movements hoping to find something good, and the hostility of those who oppose all progress. The findings of the former class were so favorable that the training school was first assisted by grants from the state, and in 1866 the school was taken over by the state and made one of the regular state normal schools of New York. For many years the school continued to send out teachers trained to put into practice more or less skillfully the maxim "that the primary concepts of all branches of knowledge come through the senses." These teachers were in demand for training schools and as supervisors of primary work throughout the country. The teachers who had grasped the meaning of their Oswego training realized that sense-perceptions must be elaborated by other forms of mental activity, and provided for this in their teaching. On the other hand, in some cases the Oswego methods sometimes degenerated into a mere giving to children masses of unrelated facts about miscellaneous objects, which did much to discredit efforts to find any better ways of teaching children than by formal book study. In spite of these failures the Oswego movement was a powerful factor in creating a general demand for trained teachers, in enriching the content of instruction in elementary schools, in promoting more scientific methods of teaching, and in making more easy and effective later educational reform. A. B.

See BARNES, MARY SHELDON; CALKINS, NORMAN A.; KRÜSI, HERMAN, JR.; OBJECT TEACHING; SHELDON, EDWARD AUSTIN.

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OTTAWA UNIVERSITY, OTTAWA, KAN. — Founded in 1886 and conducted by the Baptist denomination of that state. The institution grew out of missionary work for the Ottawa Indians, and for a time was attended by both races. Later the institution was organized for the whites only, the first college graduation being in 1886. In 1912, 440 students have been graduated, the collegiate student body numbering 165, the preparatory about 100. The physical plant consists of thirty acres of campus and four buildings. The annual budget is about $30,000 in almost equal amounts for fees and endowment funds. The faculty consists of ten members.

OTTAWA, UNIVERSITY OF, TORONTO, CANADA. — Founded in 1849 by the Oblate Fathers of Mary Immaculate as the College of Bytown. In 1866 it received the present title and power to confer degrees. In 1889 it was raised by the Pope to the rank of a Catholic University. The following courses are given by the university: preparatory or general (three years); commercial (two years); collegiate (college entrance); arts (four years, leading to B.A. or B.L.); law (three years, leading to LL.B.); philosophical; theological (four years). The large majority of students are enrolled for pre-college courses.

OTTERBEIN UNIVERSITY, WESTERVILLE, OHIO. — The institution, founded in 1847, is located twelve miles from Columbus. It is nonsectarian in its teaching, but under the control of the church of the United Brethren in Christ. It is coeducational, having been one of the first colleges in America to grant equal privileges to men and women. The University maintains a college, an academy, music and art departments. A strong summer school is conducted. There are seven buildings and forty acres of campus. The total assets (1911) were $418,591.11. The student attendance was 486, of whom 214 were in the college department. There are seven groups of studies leading to degrees in the college. The teaching staff consists of twenty-seven professors and instructors on full time and pay. W. C. C.

OUACHITA COLLEGE, ARKADELPHIA, ARK. — A coeducational institution established in 1886 under Baptist auspices. Preparatory, collegiate, business, music, and fine arts departments are maintained. The entrance requirements are fourteen units. Bachelor degrees in arts, science, literature, and music and the degree of Master of Arts are given. The faculty consists of thirty members. The enrollment in 1911–1912 was about 370 students.

OUGHTRED, WILLIAM (1575–1660). — Clergyman and teacher of mathematics, the son of the scrivener of Eton College, who also taught arithmetic. The boy became a King's Scholar of Eton, and in 1592 entered King's College, Cambridge, where he gave much attention to mathematics, and in his twenty-third year wrote his *Horologiographia Geometrica*. Foreign mathematicians came over to England to converse with him, and English mathematicians like Seth Ward and Charles Scarborough, John Wallis and Christopher Wren, the architect, came to him as pupils, and he was in touch with the chief mathematicians of his period. Any that wrote an "ill hand," he taught writing, and himself "drew his schemes most neatly, as if they had been cut in copper." He was an astrologer, and "very lucky" in this study. Nicholas Mercator, the geographer, was one of his friends. Further, Oughtred was a "great lover of chemistry," and of heraldry. Oughtred had received a classical training and turned it to account in reading all the ancient authors in mathematics, — Euclid, Apollonius, Archimedes, Diophantus, etc., — whom he read both inquiringly and critically. At Cambridge he invented an easy method of geometrical dialing, translated from English into Latin in 1647 by Mr. (afterwards Sir) Christopher Wren. He projected a horizontal instrument for delineating dials upon any kind of plane, and for working most questions which could be performed by the globe. Oughtred's enthusiasm for the study of mathematics was equaled by his love of teaching, which is shown by the fact recorded by Aubrey: "He taught all free." His most famous book was the *Arithmeticæ in numeris et speciebus Institutio: quæ tum logisticæ, tum analyticæ, atque adeo totius Mathematicæ, quasi Clavis Mathematicæ est*, London, 1631. Other editions were numerous. Oughtred also wrote on the *Delineation of Sundials by Geometry*, 1647; the *General Horological Ring and Double Horizontal Ring and Double Horizontal Dial*, 1653; on *Spherical Triangles*, 1657, and *Trigonometria*, 1657. F. W.

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OUTBUILDINGS. — See Architecture, School; Latrines.

OUTDOOR SCHOOLS. — See Open-air Schools.

OUTLINE DRAWING. — See Drawing.

OUTLINES. — See Topical Method.

OUTLINES, TOPICAL. — The topical method of study finds its most intense application in the use of topical outlines by means of which a rigid control is kept over the study of pupils, as the subtopics that develop the main topics are strictly laid down. Inasmuch as the outlines usually represent a mature reflective view of the subject rather than the genetic view characteristic of the beginner's advance from ignorance to knowledge, the use of the outline tends to curtail independent thought upon the part of the child, and to encourage the memorization of facts about the various topics. Usually the child's interests are little considered in teaching from an outline and the instruction is therefore less vital. The use of the topical outline has the advantage of being definite, and eliminative of waste effort. When the topics are in the form of questions or problems arranged in real psychological sequence rather than in the form of abstract headings, teaching from a topical outline is less artificial. Such a study from outlines is less frequent now than several decades ago. It is used more particularly with grammar grade and high school students than with primary and intermediate pupils. Its successful use depends upon the maturity of the students. It is hardly used in arithmetic and the language subjects, and considerably employed in geography, science, literature, and history. It is most largely utilized in the teaching of history. H. S.

See History, Teaching of.

OVER-AGE. — See Retardation and Elimination.

OVERBERG, BERNARD HEINRICH (1754–1826). — A German ecclesiastic and educator, was born of poor parents in the Diocese of Osnabrück and was educated for the priesthood at Münster, Westphalia. Having been ordained priest in 1780, he was appointed in 1783 to direct the Münster Normal School, a summer school for Westphalian teachers. This work he continued during forty-three years. As the province had at that time no teachers' seminary, this course offered the only opportunity for the training of teachers, and Overberg's work was of great value. The *General School Regulation for the District of Münster* (*Allgemeine Schulverordnung für das Münsterland*), promulgated in 1801, regarded at that time as a model school law, was practically Overberg's work. His *Anweisung zum Schulunterricht* (*Directions for School Instruction*), first published in 1793, is still used, a new edition appearing in 1903. At the time of its first appearance the book was translated into French and commended even by Protestant educators. Among other books which he wrote for the schools may be mentioned his *Primer* (*Neues A-B-C, Buchstabir- und Lesebuch für die Schulen Münsterlands, 1788*); *Biblical History* (1799); and the *Catholic Catechisms* (1799 and 1804). F. M.

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OVERPRESSURE (German *Überbürdung*). — A somewhat vague and general term for alleged overwork in the school. A great variety of opinions prevails in regard to the matter. Teachers and educators are apt to feel that there is little, if any, overpressure in the schoolroom except upon the teachers. Physicians, on the other hand, often strongly condemn the school for overworking the pupils and are ready to cite many cases of overpressure. Some thirty years ago there was a very strong protest against overpressure in the schools in Germany and several other European countries, especially in the higher schools. The complaint on this score has apparently been much less during the last one or two decades; and among educators many voices have been heard in protest against the danger of making pupils effeminate and self-conscious in regard to matters pertaining to their health by the great amount of attention given to school hygiene and the like.

Amid this confusion of opinion certain facts are significant and may be briefly enumerated. First, the length of the school period, the hours for beginning and closing school, the time devoted to recesses, the amount of home study required, the holidays and vacations, and the kind and amount of school work demanded, vary greatly in different countries. Again, what may be a perfectly normal amount of work for ordinary healthy children may be altogether too much and a source of serious overpressure in case of the weak and defective. Investigations in many schools in many countries have now shown that, without taking account of diseases of the teeth, from 30 to 50 per cent of the children in any school are more or less handicapped by some defect or disease. Among this group of children a large number are liable to overstrain from an amount of work that is quite reasonable for the remainder of the class. It frequently happens also that the defects of these children are not known by their teachers and injustice is done to them on this account. (See MEDICAL INSPECTION IN SCHOOLS.)

Further injustice is done by the improper grading that exists in many schools. With the ordinary classification according to chronological age and scholastic attainments, many of the children in the same class may be at a lower stage of physiological and psychological development, and hence lacking in the ability to do the amount of work that may rightly be given to other children in the same class who are of the same chronological age but of greater physiological and psychological maturity. (See GRADING AND PROMOTION; GROWTH.)

Another significant fact is the varying amount of extra-scholastic occupations engaged in by the pupils, — among the boys the selling of papers, doing errands, helping in the home work and the like; among the girls the care of other children, domestic duties, and special lessons in piano playing, dancing, etc.; and in case of both girls and boys the entertainments, parties, meetings, and the like, that are attended. It is often just because children come to school handicapped by the fatigue from outside duties or outside dissipation that it becomes necessary for special hygienic care in connection with the school work.

Statistics in regard to school diseases, fatigue, eye defects, etc., have often been cited to show the overpressure in the school. Few, if any, of these have given satisfactory evidence of overpressure in the school as a cause; but they do show that with so many cases of defect and disease there is likely to be overpressure, as a result, and that there is need of special care for the proper hygiene of instruction. In many cases also conscientious pupils, by the suggestion of ambitious teachers or parents, or the factitious stimulus of examinations (*q.v.*) and marks, not infrequently work for a cruelly long period. The older investigators found pupils in the Swedish, Danish, and German schools working ten or twelve hours a day, and inevitably spending too little time in sleep and recreation. While statistics are inadequate and often misleading, observation shows that at the present time many individuals work for an unreasonably long period in the schools in this country. Especially is this likely to occur at the time of examination and in what are supposed to be the especially important periods of school life, the ninth grade and the last year in the High School. As Dr. Dukes, the school physician at Rugby, has pointed out, we have laws against working a child's body for long hours, but there is no law to forbid working a child's brain to the limit of endurance.

Among teachers there is undoubtedly a great amount of overpressure. The nervous strain from instruction and discipline, the time spent in keeping school records, in correcting exercises and examination papers, and in preparing for special lessons, and often in the visiting of pupils in their homes, and in many cases the worry over meeting the demands of the authorities higher up and of holding one's position, not only cause many breakdowns among the teachers themselves, but the weariness of the teacher is pretty apt to react upon the pupils and becomes an important factor in mental overpressure in the school. The most immediate remedy would seem to be less red tape, a better system of grading, and the allotment of a smaller number of pupils to each teacher.

Consideration of the facts cited shows clearly that there is often danger of serious strain in the case of individual pupils, and the points to be emphasized for the avoidance of overpressure are the following: (1) Physical and mental examination of all pupils at the entrance upon school life, and periodic tests thereafter. (2) The need of a better system of grading, based upon physiological and psychological age, rather than upon chronological age and school attainments, and upon the conditions of physiological and psychological health and ability to work. (3) A better training of teachers in school hygiene so that proper care may be given to children who suffer from physical and mental defects. (4) A better distribution of the period of study, with more time for recess, better arrangement of the work, and the like, with due regard to the teaching of modern hygiene as to fatigue, the need of alternating periods of work and rest, and economical methods of learning. (5) Care in allotting of home tasks, the explanation of lessons when assigned, the abolition of school tasks as punishment, shorter examination periods and less stress upon the results of examinations, and a general regard for the obvious teachings of mental hygiene and the hygiene of instruction. (6) A smaller number of pupils to each teacher. W. H. B.

See Coeducation; Examinations, Hygiene of; Fatigue; Grading, Hygiene of; Growth; Home Study, Hygiene of; Medical Inspection; Morbidity in School Children; Physiological Age; School Management; Suicide among School Children.

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OVERSTUDY. — See Overpressure.

OVERWORK. — See Fatigue; Overpressure in the Schools.

OVID. — P. Ovidius Naso, the "laureate of the gay society" of the later Augustan period, has been, next to Vergil, the most widely read and most widely imitated of the Roman poets. Associating intimately, perhaps too intimately, with the decadent men and especially women who composed the circle of Augustus's profligate daughter Julia, he devoted himself almost exclusively to erotic poetry (*Amores, Heroides, Ars Amatoria, Remedium Amoris*), written in the elegiac measure, in the mastery of which he has never been surpassed. After recovering from the dismay inspired by Julia's disgrace and banishment in B.C. 2, Ovid turned his attention to story-telling, for which his gay and unstable genius was particularly well fitted. As his subject he chose the legends of the Greek pantheon and wrote fifteen books of Transformations (*Metamorphoses*), embodying the mythology of the ancient world from chaos to the deification of Cæsar. He also composed a poem on the Roman calendar (*Fasti*), diversified by stories of early Roman legend but before he finished it he was suddenly, without warning or explanation, exiled by Augustus in A.D. 8 to Tomi, a savage place on the Black Sea, where after unavailing lamentations (*Tristia*) and letters (*Ex Ponto*), he died in A.D. 17 or 18.

The *Metamorphoses* has been the great ancient storybook for ages. While many of the stories are unsuitable for children, yet a large number are beyond criticism, and the charm of the style, the comparative ease of the narrative, and the smoothness of the meter render a selection from these tales an admirable book with which to begin the study of Latin poetry, and thus lead up to Vergil. Consequently, where the curriculum admits of it, some selection from the *Metamorphoses* is frequently read after the first extended reading of Latin prose (usually Cæsar). When there is more time a few selections from the other poems may be added with profit.

The chief difficulty is the metrical form, the heroic hexameter, which causes such a shift in the ordinary prose order as to greatly confuse the young student. To obviate this, it would be well to rearrange the narrative in the order of prose and this is actually done in some textbooks. For the narrative, the pupil should also have access to Bulfinch's *Age of Fable*, or Gayley's *Classic Myths*. The mysteries of scansion should occupy the pupil but little at this stage, nor should much attention be paid to the influence of Ovid upon English poets. The best collection of material for the study of this influence is found in Miller's *Ovid* (American Book Co., 1910).

There has been no complete edition of *Ovid* with notes since the Variorum edition of 1827 (Oxford). The last complete text edition is by Postgate (London, 1894). Of separate poems there have been numerous modern editions, but those of the *Metamorphoses* and *Fasti* have been confined almost entirely to school books. G. L.

OVIEDO, UNIVERSITY OF, SPAIN. — See SPAIN, EDUCATION IN.

OWEN, ROBERT (1771–1858). — Born in Newtown, Montgomeryshire, Wales; the son of Robert Owen, saddler, ironmonger, and postmaster of Newtown. He was the sixth of seven children and was precocious in the development of his literary and religious interests. He had an early passion for reading, and books were left to him by the clergyman and other residents in the town. He was sent to school at a very early age and began to help his schoolmaster in teaching at the age of seven. He was apprenticed in his eleventh year to a draper at Stamford: "From ten years of age I maintained myself without ever applying to my parents for any additional aid." In 1787 (during the early days of the industrial revolution) he became assistant in the shop of Satterfield, a draper in St. Ann's Square, Manchester. In 1789 he set up as a maker of spinning mules, and quickly showed great business ability.

The second period of Owen's life, 1790–1821, was that of active occupation as a large employer. In 1790 he became a cotton spinner on a small scale in Manchester, subsequently acting as manager of a large cotton mill, and, in 1794, as managing director of the Chorlton Twist Company in Manchester. In 1799 he bought for himself and partners the cotton mills at New Lanark, near Glasgow, belonging to David Dale (*q.v.*), whose daughter, Anne Caroline, he married in the same year. In Manchester Owen had become the friend of John Dalton and Dr. Percival, and was a member of the Manchester Literary and Philosophical Society, established in 1781. From this group he gained an impulse towards the reform of the factory system and the better education and housing of apprentices and working people. He organized the rough and ignorant factory community at the New Lanark mills (about 2000 people, including 500 children sent from parish workhouses as apprentices) under paternal government, enforcing cleanliness, temperance, and religious toleration. The minimum age for employment in the mills was fixed at ten. Free education was provided for all children from five to ten years of age. The teaching and discipline in the school followed the methods of Joseph Lancaster (*q.v.*). In 1813, Jeremy Bentham and William Allen, one of the founders of the British and Foreign School Society (*q.v.*), became partners in the mill. During the years 1813–1816 Owen wrote *A New View of Society: or Essays on the Formation of Human Character*, in which he thus formulated his fundamental principle: "Any general character, from the best to the worst, from the most ignorant to the most enlightened, may be given to any community, even to the world at large, by the application of proper means; which means are to a great extent at the command and under the control of those who have influence in the affairs of men." The "plastic quality" of child nature would enable society to be "ultimately moulded into the very image of rational wishes and desires." "All poverty and crime are the effects of error in the various systems of training and government." "The end of government is to produce the greatest happiness to the greatest number." National reform was to be based, in Owen's view, on (1) restriction of the drink traffic; (2) maintenance of the national Church, but as an institution without formularies and without any declaration of religious belief; (3) reform of the Poor Law; (4) universal elementary education from infancy: "The infants of any one class in the world may be readily formed into men of any other class." "Every State to be well governed ought to direct its chief attention to the formation of character; and the best governed State will be that which shall possess the best national system of education." The national system of education was to be uniform throughout the United Kingdom, upon non-denominational lines, under the control of the central government, which should provide and support training colleges for teachers and appoint teachers to the schools; (5) "the obtaining regular and accurate information relative to the value of and demand for labour over the United Kingdom." Official quarterly labor statistics, showing wages and unemployment in each district, were to be published with a view to greater mobility of labor; (6) provision by the Government of works of national utility (roads, canals, harbors, etc.) for employment (at wages less than the average rate of private labor in the district), of those not able to find work in competitive industry.

Owen and his work at New Lanark quickly became famous. In 1814–1815 he pressed for a new Factory Act. In 1817 Owen published a plan for the establishment of industrial communities, self-contained, educationally organized, and self-supporting, upon a coöperative basis, — a new type of social organization, which, in his belief, would gradually become universal. The plan involved a degree of governmental control which was resented by Radical individualists as likely to strengthen the authority of the existing Government. In 1818 Owen visited Switzerland and saw Oberlin, Pestalozzi, and Fellenberg (*qq.v.*). In 1819 he estranged public sympathy by a public declaration against Christianity. In 1824 he heard of an estate on the Wabash river in the state of Indiana which belonged to a German colony which had emigrated from Württemberg under the guidance of a Lutheran teacher, Rapp. This society had given the name Harmony to the estate, from which they now wished to move on. In 1825 Owen bought the village, with 20,000 acres, for £30,000. Before his return to England in 1825 he had established a community of 900 people at New Harmony, to which he returned in 1826–1827 and 1827–1828. Difficulties arose in the society and the colonists gradually gave up the principles of communism upon which their brotherhood had been originally based. In 1828 Owen finally broke off his connection with New Harmony, having spent over £40,000 upon the experiment.

In 1829, after long friction with his partners, he withdrew from New Lanark. In the years 1829–1858 he was continuously engaged in propaganda on behalf of coöperation and socialism, devoting his private fortune to the diffusion of his ideas. In 1832 he opened an equitable labor exchange in the Gray's Inn Road, but the new institution survived but for a short time. His activity stimulated the growth of the coöperative movement throughout England, and he never failed to emphasize the importance of education as one factor in economic progress. In 1854–1856 Owen was converted to spiritualism by an American medium. He died at Newtown, the place of his birth, November 17, 1858. Of his three sons, Robert, Daniel, and David Dale, the two last became Professors in American Colleges.

Owen was single-minded, devoted to his fellow men, untiring, undiscriminating; the spiritual father of a great movement; a prosy saint, successfully unsuccessful; a seer who prophesied, with fatal one-sidedness, one side of the truth of social and educational reform. He was blandly impermeable to the prick of facts; philosophically unphilosophical; scientifically unscientific. He emphasized (1) the importance of social environment in the development of character; (2) the need for an economic structure of society in conformity with a new ethical ideal; (3) the necessity for using capital in the organization of community life; and (4) the value of well-directed education from infancy. But he underestimated the power of heredity; he overlooked the bad side of human nature; he underrated the complexity of the economic structure of industrial society; he exaggerated the power of direct instruction upon character; he was oversanguine as to the practical efficiency of governmental action; and he did not clearly decide whether the ultimate basis of social control is to rest on the majority vote of adult male citizens or upon some enlightened despotism, whether individual or bureaucratic. His persevering but tedious speeches disseminated socialistic ideas, but failed to convince national opinion, which preferred a combination of individual effort and state regulation.

M. E. S.

See New Harmony Movement.

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OWEN, ROBERT DALE (1800–1877). — Educational writer and social reformer; was the son of Robert Owen (*q.v.*). He was educated in Fellenberg's (*q.v.*) institution at Hofwyl, and was one of the active promoters of the New Harmony community. After the abandonment of the social experiment, he engaged in journalism and political life. He was a member of the Indiana legislature and the Congress of the United States. He was active in the organization of the Smithsonian Institution (*q.v.*), and later served as ambassador of the American government to the kingdom of Naples. His educational writings include *Outlines of the System of Education at New*

Lanark, Scotland (1824), *Moral Philosophy* (1831), and his autobiography, *Threading my Way* (1874). W. S. M.

OWENS COLLEGE. — See MANCHESTER UNIVERSITY.

OXFORD CAPS. — See ACADEMIC COSTUME.

OXFORD COLLEGE FOR WOMEN, OXFORD, OHIO. — The oldest Protestant college for women conferring the B.A. degree in the United States. It was founded in 1830 by President Bishop and Professors Scott and McGuffey of Miami University, a neighboring institution. There have been more than 4500 students, including many women eminent in public life. The institution is one of the few women's colleges of full collegiate grade west of the Atlantic states. Fifteen units are required for entrance and 120 hours of college work for the B.A. degree, seventy of which are specified. The greatest stress is laid upon history, language, philosophy, and music. About 200 students are enrolled each year. The faculty consists of twenty members.

J. S.

OXFORD UNIVERSITY. — **Origins.** — The story which attributes the foundation of a university at Oxford to Alfred the Great is purely mythical and rests chiefly upon an impudent insertion in Camden's edition of Asser Menevensis. No schools of any kind or sort can be shown to have existed at Oxford till the beginning of the twelfth century. Somewhere in the decade 1110–1120 Theobaldus Stampensis (*i.e.*of Étampes in Normandy) became a Master at Oxford. His extant works are a short and violent attack upon the monks, (*Improperium contra monachos*), and five letters, in the earlier of which he is described as a " Doctor " or " Master " of Caen, in the later as " Master of Oxford." The *Improperium* provoked a reply in which it is stated that Theobald was teaching " sixty or a hundred scholars more or less " at Oxford. (Migne, T., Vol. CLXIII, c. 759; extracts in T. E. Holland, *Collectanea* (Vol. II, p. 156: Oxf. Hist. Soc.). In 1133 we hear of a more famous Master, the theologian Robertus Pullus, as teaching in Oxford. (*Oseney Chron.*, ed. Luard, *Annal. Monast.*, Vol. IV, p. 19). The jurist Vacarius certainly taught Roman Law in England in 1149, and at some time or other taught in Oxford (Rob. de Monte, *Chron.*, ed. Migne, T., Vol. CLX, p. 466; Gervasius, Cantuar., *Actus Pontificum Cant.* ed. Stubbs, Vol. II, p. 384.) It may be that the Oxford teaching was as early as 1149, though there is some reason for suspecting that it was later. These are the only allusions to schools at Oxford before the year 1167. Soon after that date — but not before — we find Oxford blossoming out into what a little later came to be known as a *Studium Generale, i.e.* a place of study which attracted students from distant regions. At about that date Henry II, then engaged in deadly conflict with his rebellious and exiled Archbishop, Thomas Becket, ordered that all clerks then resident abroad should return to England, " as they love their benefices " (*Materials for the Life of Becket*, ed. Robertson, I, 53); and a contemporary tells us that " the king wills also that all scholars be compelled to return to their country or be deprived of their benefices " (*l.c.* VII, 146). John of Salisbury likewise informs us of a certain old prophecy that the " Mercuriales " (*i.e.* scholars) should be depressed, which had now in the year 1167 been fulfilled, for the " Mercuriales have been so depressed that France, the mildest and most civil of nations, has expelled her foreign scholars " (*l.c.* VI, p. 236). This may refer to some action on the part of the French, or it may be a rhetorical way of expressing the effect of the English king's edict. Taken together, these passages make it clear that somewhere about 1167–1168 there must have been a great exodus of English scholars from Paris, which was then the usual place of higher education for Englishmen, and others would be prevented from going to Paris for the first time or from returning after the long vacation.

It was the wont of medieval scholars, when a quarrel with the authorities or the townsmen or other untoward events prevented their continuing their studies in one place, to transfer themselves, with whatever in the way of scholastic organization they possessed, to a more hospitable city. Most of the older Universities of Europe — except the few great Mother Universities — were founded by scholastic migrations of this kind. It may be treated as certain that somewhere in England — at one place or at more than one — a *Studium Generale* would grow up in consequence of this exodus from Paris. As a matter of fact, we hear of nothing entitled to the name of a *Studium Generale* anywhere in England but at Oxford; at Oxford we do hear of such an institution within a few years after the migration of 1167–1168, but not before those years. At about this date we begin to hear of scholars coming to Oxford from distant regions, the names of " writers," parchment makers, and illuminators begin to multiply in deeds relating to Oxford property, and sermons were preached expressly for "clerks from various parts of England." (Thómas Saga Erkibyskups, ed. *Materials*, II, p. 99; Rashdall, *Universities of Europe in the Middle Ages*, Vol. II, p. 342 sq.) In 1184 or 1185, Giraldus Cambrensis tells us that he read his *Topographia Hibernica* to " all the Doctors of the different faculties, and such of their pupils as were of greater fame or note "; and on another day to " the rest of the scholars " (ed. Brewer, Vol. I, pp. 72, 73). In 1190 a student of the low countries at about the age of twenty crosses the sea to study the liberal arts at the *commune* (i.e. *generale*) *studium litterarum* at Oxford (*Emonis Chron.*, ap. Pertz, *Mon. Germ. Hist.*, xxiii, p. 467); while in the year 1209 an event occurred which reveals the existence, according to a contemporary estimate, of 3000 students at Oxford.

This was the period of the great quarrel between King John and the clergy. The realm was under an interdict; the King was excommunicated or threatened with excommunication. At such a time it went hard with clerks who quarreled with their lay neighbors. The murder of a woman by a scholar led to a violent "town and gown" riot of the kind habitual in all medieval universities, and two or three of the scholars were hanged by the townsmen with the consent of the King. Matthew Paris (*Chron. Maj.*, ed. Luard, Vol. II, pp. 525–526, 569) tells us that 3000 scholars left Oxford, and resumed their studies elsewhere — some at Cambridge, others at Reading. The town remained almost destitute of scholars till 1213, when John's submission to the Pope compelled the townsmen of Oxford to humble themselves before the ecclesiastical authorities. The ordinance issued by the Papal Legate in 1214 constitutes the first official recognition of the University which has come down to us. (*Munimenta Academica*, ed. Anstey, pp. 1–4.) The actual offenders were to do penance by marching in procession, barefoot and without coats, to the grave of their victims, followed by the whole body of townsmen, and were then to escort the bodies to the cemetery for the solemn ecclesiastical burial which had apparently been denied to them. The town was for ever to pay forty-two shillings a year to be expended on a feast of bread and beer, pottage, and meat or fish to a hundred scholars. In future, a clerk arrested by the town authorities was to be surrendered on the demand of "the Bishop of Lincoln or the Archdeacon of the place or his official or the Chancellor, or whomsoever the Bishop of Lincoln shall depute to this office." This is the first mention of the Chancellor of Oxford. He is subsequently spoken of as "the Chancellor whom the Bishop of Lincoln shall set over the scholars therein." These words seem to indicate that no Chancellor had yet been appointed or at least officially recognized.

Early Organization. — As to the organization and government of the University prior to the year 1214, we are left wholly to conjecture. It is probable that the Masters and scholars who transferred themselves from Paris to Oxford in the time of Henry II would reproduce at Oxford what organization already existed at Paris. A *consortium* or company of Masters is known to have existed in Paris at about this date (1170), and we may therefore assume that from this time a rudimentary "University" or gild of Masters existed in Oxford; but at Paris — and, therefore, it may be presumed, at Oxford — the organization was of the most elementary description. The gild, in all probability, had no officers of its own, no written statutes, no common seal. The Masters held meetings for the purpose of admitting new members, already licensed by the Chancellor of the Cathedral, to their society by the ceremony of inception (*q.v.*) by which they were held to become full Masters. At Oxford there was no Cathedral or Collegiate Church from the Chancellor of which the Masters could obtain their *licentia docendi*. How the licenses were granted prior to 1214 we do not know; possibly they were granted by the Archdeacon, or the Masters may have ventured to grant licenses themselves, or to elect a Master who may have been called *Rector Scholarum* (a title said to have been borne by Robert Grosseteste (*q.v.*), subsequently Bishop of Lincoln, it may be before 1214, *Lincoln Reg.* Sutton, f. 117), or he may even have been popularly known as Chancellor. At all events, when the Chancellorship came into existence, it was clearly an attempt to reproduce the Parisian Chancellorship, in so far as it could be reproduced without a Cathedral chapter. The Chancellor was the Bishop's educational officer; he granted the license and exercised an extensive ecclesiastical jurisdiction over Masters and scholars — a jurisdiction which was constantly extended throughout the medieval period by successful charters or concessions from King, Pope, or bishop. From the first, the absence of a chapter placed him in very different relations to his scholastic subjects from those which obtained at Paris. At Paris the Chancellor was a member of a hostile corporation; his rule was violently resisted by the scholars; their gild or University grew into corporate existence very largely as a means of emancipation from his authority. At Oxford the Chancellor was — possibly from the very beginning — elected by the Masters themselves out of their own body. He was the instrument and the representative of their privileges and exemptions from ordinary jurisdiction. Under these circumstances the University required no other head. He soon became, if he was not from the first, the recognized head of the University as well as the Bishop's representative and judge. He may be described as the Parisian Chancellor and the Parisian Rector rolled into one, and something more. His authority grew as rapidly as that of his Parisian prototype diminished, and he gradually became more and more independent of the authority which he nominally represented. The necessity of the episcopal confirmation was abolished by papal authority in 1368 (Wilkins, *Concilia*, Vol. III, p. 75); and in 1395 he was exempted from all episcopal and archiepiscopal authority (*Mun. Acad.*, p. 78; Wood, *Annals*, Vol. I, p. 365).

The growth of the University's internal organization followed in the steps of the Parisian development — always with the enormous modifications required by the different position of the Chancellor. The University, as at Paris, was divided into the Faculties of Theology, Law (here Civil as well as Canon Law), Medicine and Arts. But the superior Faculties had little organization of their own; they never possessed Deans. The Masters of Arts were for a time divided into Nations. We first hear of the Proctors in 1248 (*Mun. Acad.*, p. 777). At first, there is some reason to believe that there were four Nations and four Proctors (sometimes called " Rectors or Proctors "), as at Paris. But from an early period there were but two Nations, the Southerns (*Australes*) and the Northerns (*Boreales*), each with one Proctor. The Welsh, Irish, and continental students were included in the Southern, the Scotch in the Northern, Nation. And after a great faction fight in 1274 it was solemnly resolved that there should be only one Nation at Oxford (Doc. in *Archives*; Rashdall, Vol. II, p. 369). There continued to be a Southern and a Northern Proctor, but the Faculty of Arts debated and voted as a single body, jointly presided over by the two Proctors. No Rector was required at Oxford, for meetings of the whole University were presided over by the Chancellor; but, just as at Paris the Rector of the Artists passed by imperceptible stages into the position of Head of the whole University, so the two Oxford Proctors — originally the representatives of the Regent Masters of Arts, became the executive, under the Chancellor, of the whole body. As at Paris, the voting in the University Congregations was " by Faculties," the Non-regent Masters of Arts here forming a separate " house " with the four Faculties, and a majority of the five bodies was ultimately considered to bind the whole University. Thus in the fully developed Oxford Constitution there were three distinct Congregations or Convocations: (1) the Great Congregation (to which the name of Convocation was eventually reserved), consisting of the Regent (*i.e.* actually teaching) Masters of all Faculties, and the Non-regents, (2) the Congregation of Regents (in all Faculties) which met, from about 1327, in the Congregation-house, adjoining St. Mary's Church; (3) the " lesser," " previous," or " black " Congregation, consisting of Regent Masters of Arts alone, which met in the now demolished Church of St. Mildred's, summoned and presided over by the two Proctors. Permanent statutes had to be first promulgated in the Black Congregation; at one time the Artists contended that their veto was fatal to further progress, but by the fifteenth century it had been established that promulgation in the Black Congregation was enough, even if the Regent Masters of Arts voted against the Statute. This complicated Constitution lasted throughout the Middle Ages, and, indeed, — with some small changes in the sixteenth century, — till it was superseded by the code of statutes imposed upon the University by Archbishop Laud. The Black Congregation has left behind it a curious relic in the power still legally possessed by the two Proctors, but hardly exercised except on two historic occasions in the nineteenth century, of vetoing a resolution of Convocation; this was the Laudian substitute for their ancient power of stopping a Statute by refusing to summon the Black Congregation.

University and Town. — It would carry us beyond our limits to attempt to trace the successive steps by which the University acquired first independence of, and then a virtual supremacy over, the town and its authorities. From the first the students were, as in northern Europe generally, treated as *ipso facto* clerks and enjoyed the usual clerical immunities from the jurisdiction of the ordinary courts. In 1231 the Chancellor was allowed to use the town prison over the North Gate — facetiously known as Bocardo, that being the technical name for a mood in the scholastic logic which it is peculiarly difficult to " reduce " or get out of — for the confinement of refractory clerks (*Letters of Henry III*, ed. Shirley, Vol. I, p. 399). A royal charter of 1244 (Ayliffe, *Ancient and present State of the University of Oxford*, App., p. vi) recognized his jurisdiction in all actions of debt or " contracts of moveables " in which one party was a clerk — a jurisdiction extended to all personal actions in 1275 (*Rot. Pat.*, 3 Edw. I, m. 6). The most famous of all " town-and-gown " riots — " the slaughter " of St. Scholastica's Day, in 1354, which may be described as a pitched battle fought with swords and bows in the streets of Oxford for two days, ended in the defeat of the University and the killing of many scholars. (Authorities mentioned in Rashdall, Vol. II, p. 405.) The University actually throve on its misfortunes, and the great charter of 1355 (*Rot. Chart.*, 29 Edw. III, m. 5) condemned the Mayors, Bailiffs, and sixty burghers of Oxford annually to appear at St. Mary's Church to cause a high mass to be said for the souls of the victims, and each to offer a penny on the altar to be divided between the curate and certain poor scholars. A communion and sermon being substituted for mass at the Reformation, the observance lasted till 1825 (Cox, *Recollections*, p. 112). At the same time, the Chancellor's jurisdiction was extended to all cases both civil and criminal in which one party was a scholar — except cases of treason, felony, and " mayhem." The jurisdiction of the Chancellor's court still remains unimpaired as regards civil causes, and in an attenuated form in criminal cases. Besides these privileges, the University long retained a considerable share in the policing and general government of the town. Till 1868 the " night police " — which represented the ancient " watch " — remained under the control of the University proctors; and the University still sends representatives to the City Council.

Secessions. — Disputes with the City or internal feuds in Oxford as elsewhere led to secessions, sometimes of considerable duration, but none of them — after the foundation of Cambridge — leading to permanent Universities. Northampton (1228, 1263), Salisbury (1238-1278), and Stamford (1334) were the chief scenes of these secessions (Rashdall, Vol. II, p. 395 sq.). An oath binding incepting Masters not to lecture in Stamford continued to be taken by B.A.'s till almost within living memory.

Halls and Colleges. — As in other medieval Universities the usual method of living — except for the wealthy noble who resided with a numerous retinue in a house of his own, and the poor " Chamberdekyn " who lodged with a townsman — was for a party of scholars to hire a house (at Oxford usually known as a " Hall " or " Inn "), employ their own servants and divide the cost of living among themselves. One of the party, known as the Principal, gave security for the rest and presided over the establishment, but the Principal was at first — at least nominally — elected by the community which formed a self-governing society, making its own " statutes, " administering its own funds, and in the last resort controlling its own discipline. But the supervision of the University gradually extended itself to the internal affairs of the Halls and rendered the authority of the Principals more and more independent of their subjects, although they continued to be nominally elected by the students even after; in the 16th century, the real nomination passed to the Chancellor. A code of statutes made by the University for the government of the Halls certainly existed by the second half of the fifteenth century, if not earlier, and in 1432 the University insisted that the Principal of a Hall should be a graduate (*Mun. Acad.*, p. 307). The Colleges were at first simply endowed boarding houses for poor scholars. They provided only for members of the foundation, and had nothing to do with the education of these: all resorted to the public schools for their lectures — lectures given by the " Regent " Doctors or Masters, and in part, especially in the higher faculties, by Bachelors who were at the same time pursuing their own studies. At Oxford the colleges were chiefly intended for Masters, or at least Bachelors, of Arts who after finishing their course in Arts required pecuniary assistance to enable them to enter upon or continue the long course in one of the " superior Faculties," especially in the unlucrative Faculty of Theology. The earliest of these foundations — as regards the date of its founder's bequest — which came to be known as " the Great Hall of the University " or (later) University College — was a very simple affair: a provision for two or more Masters of Arts studying theology, founded by William of Durham, who died in 1249. But it was not till 1280 that the Hall really came into existence, and then the endowment was only equal to the maintenance of four Masters. By this time two other colleges had come into being, *viz.* a small foundation for Artists, supported from about 1261 by John de Balliol, Lord of Barnard Castle, as a penance for having " unjustly vexed and enormously damnified " the Church of Tynemouth and the Church of Durham (Matt. Paris, *Chron. Maj.*, ed. Luard, I, 528), — subsequently turned into a permanently endowed institution by his widow Dervorguilla (1282), — and the much more elaborate community known as Merton College, founded by Walter de Merton, Bishop of Rochester, in 1263 or 1264. The " rule of Merton," a body of Statutes given to the College in 1263 and amended in 1270, was imitated by later founders, and permanently fixed the type of the English College. The leading note of the College, as contrasted with some Continental colleges, was its complete autonomy. The only external authority which could meddle with its affairs was the Visitor — in the case of Merton, the Archbishop of Canterbury. The scholars elected their own Warden and other officers, filled up their own ranks, and controlled the management of their own property. A small body of " poor boys " — still under the instruction of the Grammar-master or in the earlier stages of their arts course — were also supported by the foundation, but took no part in its government. This distinction was followed in other colleges, and eventually the name "Fellows" (*socii*) came to be applied to the full members of the Society (usually graduates), while the term "Scholars" was in popular parlance reserved to the inferior foundationers, who began as undergraduates, though the scholarship was often retained till the degree of M.A. was taken. In some cases the ordinary administration of the College was in the hands of a body of senior Fellows, but in nearly all, the youngest full Fellow (after a year of " probation ") voted at elections and in some of the more important affairs of the house.

In the next column is a list of the Oxford colleges with the dates of their foundation and names of their founders; the monastic colleges, suppressed at the Dissolution of Monasteries, are bracketed.

Keble College, founded in 1870 by subscription in memory of John Keble (*q.v.*), one of the leaders of the " Oxford Movement," and confined to members of the Church of England, is not technically a College of the University, but enjoys practically much the same position.

Balliol . . .	1261–1266	John de Balliol and his wife Dervorguilla. (Charter, 1282.)	For Artists only: Theological Fellowship added by Sir Philip Somerville in 1340.
Merton . . .	1263 or 1264	Walter de Merton, Bp. of Rochester.	
University . .	1280	William of Durham.	
(Gloucester) .	1283	John de Gifford, Lord of Brimsfield.	Benedictine.
(Rewley) . .	1280	Edmund, Earl of Cornwall.	A Cistercian Abbey.
(Durham) . .	c. 1289		Chiefly for Benedictine monks of Durham.
Exeter . . .	1314–1316	Walter de Stapeldon, Bp. of Exeter.	
Oriel . . .	1324	Adam de Brome; nominally King Edward II.	
Queen's . .	1341	Robert de Eglesfield, Chaplain of Queen Philippa.	
(Canterbury) .	1362	Simon Islip, Abp. of Canterbury.	Chiefly for Canterbury monks.
St. Mary College of Winchester (commonly called New College)	1379	William of Wykeham, Bp. of Winchester.	
Lincoln . . .	1429	Richard Fleming, Bp. of Lincoln.	
(St. Bernard's)	1432	Henry Chicheley, Abp. of Canterbury.	Cistercian.
(St. Mary's) .	1435		For Augustinian Canons.
(St. George's-in-the Castle)	1435		For Augustinian Canons of Oseney.
All Souls . .	1438	Henry Chicheley, Abp. of Canterbury.	
Magdalen . .	1448	William of Waynflete, Bp. of Winchester.	
Brasenose . .	1509	William Smyth, Bp. of Lincoln and Sir Richard Sutton.	
Corpus Christi	1516	Richard Foxe, Bp. of Winchester.	
Christ Church	1532	Henry VIII: previously, as Cardinal College, by Cardinal Wolsey.	
Trinity . . .	1554–1555	Sir Thomas Pope.	On site of Durham College.
St. John's . .	1555	Sir Thomas White, Alderman of London.	On site of St. Bernard's.
Jesus . . .	1571	Queen Elizabeth and Dr. Price.	
Wadham . .	1612	Nicholas and Dorothy Wadham.	
Pembroke . .	1624	Nominally James I; Richard Tesdale and Richard Wightwick, B.D.	
Worcester . .	1714	Sir Thomas Cooke, Bart.	On site of Gloucester Hall.
Hertford . .	1874	Thomas Baring.	On the site of Magdalen Hall.

Instruction. — Originally, as we have seen, only an insignificant fraction of the University lived within College walls. But gradually a great change came over the relations of the Colleges to the University. The fundamental defect of the earlier medieval Universities was the absence of any adequate provision for the teachers. This defect was overcome in different parts of Europe by different means — in Italy chiefly by state subvention; in Spain and to some extent in Germany by the annexation of ecclesiastical revenues; at Paris and Oxford, so far as it was overcome at all, by the aid of the Colleges. Originally the Regent-Masters derived their support entirely from the scanty fees of the students. The system could hardly have lasted as long as it did but for the fact that many of the Masters held Cathedral prebends or parochial benefices. But this applied chiefly to the superior Faculties, the Doctors and Bachelors of which were frequently dignified and well-beneficed ecclesiastics. In the Faculty of Arts the Masters were usually quite young men; the new Master was required to stay up and lecture for a year, and could lecture as long as he pleased afterwards. Indirectly the Colleges contributed to secure competent teachers by enabling men to take the Master's degree who could not otherwise have afforded to do so, and probably enabled many to go on lecturing for more than their "necessary regency" while beginning their studies in the higher Faculties. But, at best, formal public lectures and disputations supplied very inadequate instruction for the younger students of Arts — many of them mere boys of twelve or fourteen. In the Colleges a certain amount of less formal assistance was given to the younger members of the foundation by the older ones. At New College the younger members were assigned to regular Tutors during the earlier portion of their course. Moreover, some College Statutes provided that other members of the University might be received as paying boarders (*Commensales* or Commoners). When these were undergraduates, they shared in the instruction given to the younger foundationers. At Paris this system prevailed on a very large scale as early as the fourteenth century: at Oxford we hear comparatively little of it till after the Reformation; but the system of domestic instruction was no doubt more or less imitated in the Hall communities of unendowed students. And the instruction provided within the walls of Colleges and Halls was likely to be both more efficient and better adapted to the wants of young students than the formal lectures given by a young, fluctuating, and casually chosen body of Regents in the public schools. For these reasons the College teaching became more and more important and the teaching of the public schools more and more perfunctory. A University Statute of 1408 allows most of the lectures required for the degree of B.A. to be heard in College or Hall with a "recitation duly following" (*Mun. Acad.*, p. 241). This tendency was stimulated by the change which came over our University studies at the time of the Renaissance. It was in the Colleges that that increased attention to the teaching of Latin Grammar and composition. which was the earliest phase of the Renaissance movement began to show itself; and it was in the Colleges that Greek was first taught. The promotion of these new studies was one of the declared objects of the characteristically Renaissance College of Corpus Christi, where a public " Reader or Professor of the arts of Humanity " (*i.e.* of Latin) whose special function it was to be to " extirpate and eject barbarity from our hive," and another of Greek (for the benefit apparently of the whole University and not merely of the College), formed a part of the Founder's scheme. The lectures in the public schools adhered to the old routine: they were scholastic lectures on the Latin Aristotle, attendance at which was more and more completely dispensed with by the University. In 1449 all the Regents are allowed to lecture out of the official University Schools in School Street (north of St. Mary's Church). In 1508 the Regents supplicate " not to be compelled to deliver their ordinary lectures for the greater part of an hour because none listen to their lectures" (*Causa est quod nulli audiunt eos legentes*, University Register; Rashdall, Vol. II, pp. 516–517). It is clear that by this time the lectures in School Street have become a farce, and all the effective instruction of the University has passed to the Colleges. Endowed professorships of divinity, civil law, medicine, Hebrew, and Greek were founded by Henry VIII in 1546, and a small number of other professorships by private benefactors in the following century. But these still left most of the instruction of the ordinary undergraduate in the hands of the College Tutors and the Principals of Halls. And of the Halls only a few survived the medieval period. Of these, all but St. Edmund Hall were merged in some adjoining College by the last University Commission.

Studies. — We must now turn from questions of organization and constitution to the studies which the organization was intended to facilitate. Law was a prominent study in almost all the medieval Universities. At Oxford, as elsewhere, a large proportion of the older, and particularly of the richer and better-born students, entered upon that faculty — usually, perhaps, after a certain amount of study in arts, not always ending in graduation. But Law was necessarily less prominent in England than elsewhere, because in England, and in England alone, a system of Law of non-Roman origin attained, early in the Middle Ages, a sufficiently scientific form to have developed a legal education of its own. Elsewhere, even when the Law was of Teutonic or non-Roman origin, its practice fell into the hands of practitioners who had studied Roman Law in the Universities, and everywhere the law of the tribunals became more or less Romanized in consequence. In England the early growth of the Inns of Court prevented the Universities becoming in any direct and habitual manner places of education for the English bar. The Inns of Court (*q.v.*) in London were virtually a University of English Law. In the medieval Oxford the Civil Law was studied merely as a preparation for, or in conjunction with, the Canon Law; only the Advocate in the ecclesiastical Courts with a small number of practitioners in the Court of Admiralty and perhaps in the Chancery got their professional education in the Universities. After the medieval period, the study of Canon Law ceased, and any serious study of the Civil Law rapidly dwindled, though the practitioners in the ecclesiastical Courts continued perfunctorily to take the degree of Doctor as a condition of their admission to the " College of the Advocates," commonly known as " Doctors' Commons," in London.

The study of medicine was also relatively unimportant, even in the Middle Ages, though Oxford could boast a few physicians of European fame such as John of Gaddesden, author of the *Rosa Medicinæ*. In post-medieval times the serious study of Medicine was connected with the Hospital Schools of London and other large towns, though the higher class of physicians still took medical degrees in the Universities. This absence of professional study left a permanent mark upon the traditions and the spirit of Oxford. Down to quite recent times it was, and as regards the majority of its students it still is, the distinguishing note of the English Universities that the bulk of their students were engaged in " liberal " studies which had no relation to their future professional occupations. Continental visitors are amazed to find future barristers engaged, up to the age of twenty-three or thereabouts, in the study of philology and philosophy, of history or natural science, and future clergymen postponing the study of theology till they have left the University.

In the Middle Ages the fame of Oxford depended mainly upon its reputation as a studium of theology and arts — that is to say, chiefly of the scholastic philosophy. The subject matter of these studies was much the same as at Paris. (See Paris, University of.) Details varied, but here, as everywhere, the theological textbooks were the Bible and the *Sentences* of Peter the Lombard; while Aristotle — with Porphyry's *Isagoge* and some works of Boethius — formed the principal basis of the Arts course. It is noticeable, however, that in the earlier Middle Ages, physical science was treated more seriously than at Paris. The first recorded Chancellor or " Rector of the Schools," Robert Grosseteste (*q.v.*), known to the Middle Ages as Lincolnensis, was famous for his scientific writings. Peckham (known also as John of Pisa) wrote a famous book called *Perspectiva Communis*.

It was not a mere accident that Oxford produced that illustrious " anticipator " of scientific ideas and critic of scholastic methods, Roger Bacon. He tells us that *Perspective* was taught here when it was unknown at Paris. In his time (as we gather from his works) and throughout the Middle Ages there was rather more recognition of mathematics than at Paris. Six books of Euclid were " taken up for the Schools " (*Mun. Acad.*, p. 415). For an account of the methods of lectures and disputations, of qualifying for and taking the various degrees, the reader may be referred to the article on Universities, but it is worthy of notice that examination was rather less prominent here than at Paris. The still surviving preliminary examination, known as Responsions (the candidate was said *respondere quæstionibus magistrorum scholarum*), can be traced from the thirteenth century, but there was no examination in the strict sense for the license or the Mastership in Arts, and it is doubtful whether there was one for the Bachelorship of Arts. To obtain the master's degree nine Masters of Arts had to " depone " to his fitness " of knowledge " (*de scientia*) and nine others " to the best of their belief " (*de credulitate*). They had to judge of the candidate's efficiency, it would appear, merely from his performances in the various disputations and his general reputation. It is a curious illustration of the continuity which characterizes Oxford history that nine Masters of Arts must still be present in the "ancient house of Congregation," for the conferment of an ordinary degree.

Fame and Numbers. — We have seen that very early in the thirteenth century Oxford already boasted of 3000 students, according to the medieval estimate, *i.e.* probably in reality less than 1500. It was by this time the most famous university in Northern Europe, next to Paris. Already in 1257 Matthew Paris calls Oxford "the second school of the Church " (*Chron. Maj.*, V. 618). It could boast famous teachers in Robert Grosseteste, Roger Bacon, the canonized Edmund Rich, and John Peckham, Archbishops of Canterbury. But it was not till the end of the thirteenth century that Oxford produced a great schoolman who could rival the reputation of Thomas Aquinas and the other great Parisians. Paris had been the scene of the great scholastic movement which had substituted an Aristotelian for a Platonic-Augustinian Philosophy as the basis of the Church's scientific Theology. The task of refuting the unorthodox "Averroistic" interpretation of Aristotle, of Christianizing Aristotle and Aristotelianizing Christianity, had been the work of the great Dominican Doctors at Paris. The attempt, while teaching and expounding the newly recovered Aristotelian works, to remain faithful to the older Platonic tradition, was begun by the Franciscan Doctors at Paris, but attained its fullest development in the rival and more conservative University of Oxford, where the Franciscan order possessed more influence than their rivals, the Dominicans. The Franciscan convent at Oxford — whose memory lingers in " Paradise Square " and " Friar's Street " — was the true home of that new epoch in the development of the scholastic Philosophy which culminated in " the subtle Doctor," Duns Scotus (*q.v.*), who introduced the thoroughgoing Realism of the later Middle Ages. But this return to Realism provoked a nominalistic reaction; the germs of both movements may be detected in the works of the earlier Franciscans, especially Roger Bacon (*q.v.*). William of Occam, the " invincible " Doctor, the founder of the later nominalistic school, was likewise an Oxford Franciscan. During the fourteenth century Oxford — though a smaller University and less frequented by foreign students — was the home of a far more vigorous and original scholasticism than Paris or any other continental University. It was during this century that the numbers rose to their highest. The medieval estimates of 30,000 or even 60,000 students are quite fabulous; but there may have been some 3000.

Among the schoolmen of this period may be mentioned the Franciscan, Richard of Middleton; John Dumbleton of Merton; Walter Burley, the " plain and perspicuous Doctor " of Merton; Robert Holkot; the Carmelite, John Baconthorp, " the resolute Doctor "; the "profound Doctor," Thomas Bradwardine Balliol, afterwards Archbishop of Canterbury; and John Wycliffe, for a time Master of Balliol, the " Evangelist Doctor." The list closes with Wycliffe, who was for the most of his life a resident Oxford Doctor, and was a realistic schoolman of European reputation before he developed the original views which gradually broadened out into undeniable heresy. Wycliffism was essentially an " Oxford " movement, originating there and for a time dominating the University and sending forth a constant succession of " poor priests " to preach a new evangelical and anti-monastic Christianity throughout the country. It was not till about the year 1411 that an effective attempt was made to purge the University of "Lollardy." The attempt succeeded, and with Lollardy all serious scholastic thinking was suppressed. Wycliffe ends the list of famous Oxford schoolmen. It was in part the reputation for heresy which Oxford had acquired which induced pious founders to establish new Colleges at Cambridge, and pious parents to send their sons to that University. At all events it is from about the period of Wycliffe that Cambridge began to take a place of some equality with Oxford.

Renaissance and Reformation Period. — In Oxford more even than elsewhere the fifteenth century was a period of intellectual decline. Scholasticism was getting played out, and vigorous minds began to look in other directions for intellectual sustenance. The first sign that can be detected of a Renaissance consists simply in an increased attention to that preliminary training in "grammar" which always formed the basis of University studies, but which had been neglected since the Aristotelian furor of the early thirteenth century had thrown all other studies into the shade. The effects of Wykeham's provision that students of his New College should stay in the Grammar School at Winchester till they were sixteen — a late age for the medieval freshman — bore fruit. The Latinity .of Thomas Chandler, Warden of New College from 1454, has a classical ring about it, and to him is due the first introduction of Greek into Oxford. It was within the walls of New College that the Italian scholar, Thomas Vitelli, taught Greek from about 1475 till 1488 or 1489; and from him no doubt the first of English humanists, William Grocyn (*q.v.*), Fellow in 1467, received his initiation into Greek, which he afterwards taught at Magdalen, and after traveling in Italy, at Exeter in 1498, where he numbered More and Erasmus among his hearers. Erasmus resided at Oxford as the guest of Prior Charnock in St. Mary's College (the College of the Augustinian Canons, of which some remains are still to be seen in New Inn Hall Street) for some months in 1499, and from 1496 till 1504 John Colet was also teaching the Greek Testament in Oxford. Erasmus is full of compliments for the Oxford band of scholars. The brilliant promise of these years was hardly fulfilled. Theological controversies, revived by the Reformation movement, were too strong for much of the genuine Renaissance spirit to flourish in Oxford as yet. But still the knowledge of Greek and of classical Latinity went on growing. Aristotle began to be studied in the original Greek, and the theologians read the Schoolmen less and the Fathers more. The theological controversies were at least fought with new weapons — the weapons of classical scholarship and patristic learning, as well as the old scholastic dialectic. Henry VIII and the ecclesiastics favored by him sympathized with the positive side of the new Learning, and still more with its ferocity against the old. In 1535 a Royal Commission was appointed to visit the University. Here is a report of their proceedings at one of the Colleges: "In New College we have stablished a lecturer in Greek and another in Latin with an honest salary and stipend. . . . We have set Dunce [*i.e.* Duns Scotus] in Bocardo [the cant name for the town prison over the Northern Gate], and have utterly banished him Oxford forever, with all his blynd glosses, and is now made a common servant to every man, fast nayled up in all common houses of easement — *id quod oculis meis vidi.*" (Wood, *Annals of Oxford*, Vol. II, p. 62.)

The accession of Edward VI brought with it a new Commission. Fellows suspected of Romanizing tendencies were removed; many of them fled to the continent without waiting to be deprived. Avowed Protestants were put into their places. Peter Martyr was brought to England and made Regius Professor of Divinity. The effect of the Edwardian Reformation was almost to empty the University of unendowed students. The majority were of course anti-Protestant; much of the monastic property was gone; Oxford lost the monks and friars who had formerly taken courses in the University, and the exhibitions which wealthy Abbots had supplied to enable promising lads to study. No one knew what was to become of the Church's remaining property. The Church was no longer a safe career. The numbers of the University were reduced to about a thousand or less (Wood, *Annals*, Vol. I, p. 113). As the University filled up again in the time of Queen Mary and Elizabeth, the majority of the unendowed students became boarders in the Colleges — styled according to their rank and the payments they made "noblemen," "gentlemen-commoners," "commoners," or (if they lived after the manner of servitors) "battelers." A few Halls alone remained, in which the Principal lived entirely on the payments of the commoners, and education was organized very much on the model of the Colleges. The public schools were resorted to only for the disputations required for the various degrees or for the lectures of the few endowed professors. Each of the changes of religion brought with it a Commission, and a purgation of the Colleges by the removal of adherents of the beaten party. But few things enable one to realize better how very gradual was the real establishment of Protestantism in the University as in the country generally. It was not till after Elizabeth's excommunication and deposition by the Pope in 1570 that really effective methods were taken to get rid of Romanizers from the foundations. As we near the end of Elizabeth's reign, Puritanism — *i.e.* Calvinism in doctrine — became more and more dominant in the Universities, though less so at Oxford than at Cambridge. The most marked reaction against it came likewise from Oxford. Reason and conscience revolted against some elements of the Calvinistic creed; learning discovered that the discipline and ritual of the ancient Church, if it was not that of medieval Rome, was equally far removed from the Genevan model. The leader of the revolt at Oxford was William Laud (*q.v.*), a Fellow from 1593, and from 1611 to 1621 President, of St. John's College, which still treasures in its Library the copes which he provided for use in the College Chapel. The High-Church reaction in politics and religion had its center in Oxford. But nothing can testify more eloquently to the hold which

Calvinism in doctrine had obtained over Oxford, even among those who were strong supporters of Episcopacy and the Prayer-book as against the Presbyterian worship and discipline than the fact that even Laud himself in the height of his power (1635), while remonstrating with the Bishop of Winchester as to the condition of New College, did not venture to deny that "Calvin's *Institutions* may profitably be read" by students in the University, though he ventured to suggest that it was premature to make it the chief subject of study and examination for young scholars in their first two years after coming up.

Laudian Statutes. — In 1630 Archbishop Laud was elected Chancellor of the University. Towards the end of the fifteenth century it became common for the University to elect as a Chancellor an Archbishop or Bishop — later on sometimes a lay noble — who was of course usually, if not always, an absentee, leaving the practical duties of the office to be discharged by a Vice Chancellor, usually the Head of a College. But the Chancellors, though nonresident, were by no means disposed to treat their office as a sinecure; their *raison d'être*, in fact, was to protect the interests of the University at Court, and at the same time to govern it in accordance with the political and religious policy of the government for the time being. Laud might be trusted to avail himself to the full of the opportunities which he enjoyed as Archbishop, as Chancellor and as Visitor of two important Colleges. Nothing was too minute for this ecclesiastical disciplinarian, whose insistence on the "four surplices at All-hallowtide" in every parish cost the Church of England so dear. As Visitor of All Souls' he required the Warden to insist that the Fellows "use not long undecent hair, nor wear large fulling bands, nor boots under their gowns, nor any other like unstatutable novelty." Preachers who attacked Pelagianism or Arminianism or ceremonialism, were imprisoned or banished the University, or at least required to read recantations on bended knees in the Convocation house. At the same time Laud was a real patron of learning, bestowed a valuable collection of Oriental and other Mss. upon the great Library founded by Sir Thomas Bodley in 1602, and endowed a professorship of Arabic. But the greatest memorial of his Chancellorship is the compilation of a new code of statutes, — the first systematic codification of the University's laws and customs which had ever been undertaken.

Since the close of the medieval period the old order of the University had been more and more falling to pieces. The statutes had largely become obsolete; it was hardly known which of them had been and which had not been legally repealed; the old machinery of lectures in the schools, examinations, disputations, and other exercises for degrees, had little relation to the real studies of the place, which for the most part went on in the Colleges over which the University had no control. The old forms were sometimes kept up, sometimes dropped. On paper, the University was still the University of the Middle Ages, teaching scholasticism in its public schools; in practice it had become an aggregate of almost autonomous Colleges, which taught no doubt with some of the old-time knowledge the learning of the Renaissance and the Reformation. It is unnecessary to trace the various attempts at reform of the University constitution which took place in the course of the sixteenth century and the first half of the seventeenth. Laud's more vigorous exertions led to the enactment in 1636, — by the combined authority of the University, the Chancellor (to whom the University had conceded special powers in the matter), and the Crown, — of the code under which (with very few alterations or additions) the University nominally lived down to the middle of the nineteenth century. Although the University still remained without any effective control over the internal affairs of those societies, the Laudian Statutes recognized the fact that the University had largely become a federation of Colleges. The "Heads of "Houses" (*i.e.* of Colleges and Halls), with the addition of the two Proctors, were now constituted into a probouleutic Council, without whose consent no permanent statute or temporary "decree" could be brought before the "Convocation" of Doctors and Masters of Arts; and the old "Black Congregation" was abolished. A small body of Heads could be more easily managed by the authorities than the democracy of young Fellows. This body held weekly meetings and acted as the supreme executive of the University; it was commonly known as the Hebdomadal Board. The Vice Chancellor was always to be the Head of a College, nominated by the Chancellor for a year at a time. In practice, he was frequently reappointed, — in modern times usually for four successive years. The Proctors were now nominated by the Colleges in turn, and in various ways the Colleges and their officers received a recognition from the University authorities, though the attempt to secure control of them by the University, *e.g.* by giving the Vice Chancellor power to remove Tutors, did not practically amount to much. The Statutes did not merely stereotype the organization of the University; they attempted to regulate its studies. The medieval disputations were retained, but a regular examination for the degrees of B.A. and M.A. was added. And the attempt was made to galvanize into life the lectures in the public schools given by the Regents elected every two years — one in each of the "three Philosophies and seven Arts" in which there was no endowed Professor. Undergraduates and Bachelors of Arts were required to attend, for different parts of their

Oxford.

course, the lectures of the Professors or Praelectors of logic, of moral philosophy, of geometry, of astronomy, of natural philosophy, of metaphysics, of history (a recent foundation by the antiquary Camden), of Greek and of Hebrew. This magnificent program might seem to leave little time for the lectures or private instruction in the Colleges. And yet it is certain that the most serious work of most undergraduates — even in the seventeenth, and still more in the eighteenth century — was the work which he did with his tutor in College. Even in Wood's time — *i.e.* a generation or two after the Laudian reforms, — the lectures of the Regents in the schools had acquired the name of "Wall-lectures" — which in a farcical form continued to be delivered after the beginning of the nineteenth century (Cox, *Recollections of Oxford*, p. 37 sq.).

The Great Rebellion; Restoration. — The Civil War produced a violent solution of continuity in Oxford history. For some time Oxford was at once a Court and a camp; the King was quartered at Christ Church; Ministers of state and courtiers were thrust into the rooms which should have been occupied by Fellows and Scholars; hundreds of scholars took arms. Even the Puritan régime, which followed, hardly got rid of all the demoralizing effects of this episode. After the triumph of the Parliament a Commission was appointed to visit the University and Colleges, and those who would not acknowledge the authority of the Visitors were "outed" (1647–1648). Men of sounder political and religious views were thrust into their places. Assuming the necessity of such a purgation, the revolution was carried out with moderation. Some of the men put into the places of deprived Heads and Professors were among the most distinguished men of their time, such as the mathematicians Wilkins, Warden of Wadham, and Wallis, Professor of Geometry, and Pococke, who became Professor of Hebrew. With the Restoration a great decline in learning set in. In part, this was no doubt due to tendencies of the time which had nothing to do with politics. The first half of the seventeenth century was the learned age of Europe. The second half was an age of scientific discovery, of popular religious and philosophical controversy, of belles lettres. These influences affected Oxford negatively by weakening zeal for the old studies, if they did not lead to much educational reform. In particular, there was a conspicuous decline in the study of Greek; and the exaction of Hebrew imposed by the Laudian Statutes on B.A. students, if it ever took effect, certainly disappeared. Anthony Wood looks back with amazement on the fact that before the Great Rebellion there were men who used to "discourse in the public schools very eloquently in the Greek tongue" (Life of Henry Stubbe in *Athenæ Oxon.*). The growth of coffee-houses from 1650 onwards is at once an indication and a cause of the changed spirit of the place. "Why doth solid and serious learning decline and few or more follow it now in Universities?" asks the same writer in 1678 (*Life and Times*, ed. A. Clark, Vol. II, p. 429). "Answer — because of Coffey-houses where they spend all their time." Time spent in the coffee-houses was not all wasted. Here men read the *Spectator* and the newspapers, and discussed the latest book in the deistic controversy. At about the same time the Colleges began to make themselves comfortable. Fellows now lived in separate rooms, and "common-rooms" were built in which Fellows talked and boozed away most of the time after dinner, instead of retiring to their rooms and resuming their studies, as they were required to do by the College statutes. It must not be supposed that there was no learning or study in the Oxford of the Restoration and the eighteenth century. At the worst times there were always isolated Fellows who used the leisure secured to them by the College endowments for the purposes for which these were given, and there could always be discovered isolated Tutors who took their duties seriously. A little before the Revolution John Locke (*q.v.*) was a resident student and Lecturer of Christ Church. Among the professors of the eighteenth century were distinguished men, such as Halley the astronomer, Blackstone the lawyer, and Lowth, afterwards Bishop of London, whose lectures on the poetry of the Hebrews were long a classic. But the professorial lectures were for the most part on subjects unconnected with the compulsory studies of the ordinary undergraduate, or with any organized curriculum. Of the tutors, too many resembled the unfortunate man intrusted for a brief period with the education of the youthful Gibbon, who has handed him down in his *Autobiography* to the contempt of posterity, as one who "well remembered that he had a salary to receive but forgot that he had a duty to perform," and the equally unfortunate "monks of Magdalen" whose "conversation stagnated in a round of College business, Tory politics, personal anecdotes, and private scandal," and whose "dull but deep potations excused the brisk intemperance of youth."

The eighteenth century was — till towards its close — to some extent a period of academic torpor or decadence all over Europe. (See Eighteenth Century, etc.) But it is probable that no University ever sank quite so low or began its revival so late as the University of Oxford. That revival corresponds pretty exactly with the beginning of the nineteenth century. I propose to enumerate a few of the facts which may be regarded in part as symptoms, in part as causes, of this extraordinary decay. It will be observed that most of them spring from defects in the Constitution of the University which date back in many cases to the early Middle Ages, and which successive Parliaments and Governments had never made the slightest attempt to correct or reform.

(1) The fundamental defect in the constitution of Universities of the Parisian type was the absence of proper salaries for the teaching body. Everywhere the defect had somehow to be remedied, nowhere was it remedied so badly and so imperfectly as in the English Universities. The few professorial endowments supplied by Henry VIII or private benefactors became, with the decline in the value of money, increasingly inadequate. It became difficult to insist even on continuous residence; in some cases the lectures ceased to be given. It appears that about the year 1800 fifteen out of twenty professors offered lectures of some kind, but in some cases they had to be abandoned for want of an audience (*Vindication of Magdalen College*, 1800). The Regius Professors continued to be paid their £40 per annum till the middle of the nineteenth century. The rest of the teaching was left to the Colleges.

(2) College Tutors were chosen from Fellows of each College. But fellowships were never intended to remunerate teachers. The legal restriction in many cases to particular dioceses or counties, or a non-legal tradition of electing solely from the College, narrowed the field from which Fellows could be chosen. Consequently Tutors could not always be efficient, and the medieval restriction on marriage remained; even when there were no clerical restrictions on Fellowships, it was the tradition that Tutors should be in holy orders. The abler the man, the more certain he was after a few years of residence to go off to be Tutor to a nobleman's son or to take a benefice in the gift of the College. Teaching was chiefly in the hands of young men who did not intend to make a profession of teaching. Though, as late as the beginning of the eighteenth century, we sometimes find a systematic division of subjects and classes among College Praelectors, the tendency was more and more to leave the teaching of the undergraduate mainly in the hands of his own Tutor. Nobody could be efficient in all subjects; the result was the restriction of teaching to a few subjects — those which the average tutor knew best. By the middle of the eighteenth century little was taught but the classics and a little Logic. The average standard was low. The complaint that he had been fined twopence for not attending a lecture which was not worth a penny, was Samuel Johnson's testimony to his own Tutor's competency; and his experience was not exceptional. In reading the biographies and other records of the period, one is often astonished at the amount of learning and serious study which was to be found in Oxford even at its worst, but it it nearly always the studies which a select few of the Fellows carried on without reference to teaching, and which a select few of the undergraduates carried on in their own rooms without any regard to the requirements of lectures or examinations.

(3) If the Tutors were inefficient, still less were the bulk of the Fellows not engaged in tuition really fit for the higher studies which they were supposed to be pursuing; and there was little inducement to become so. The part of the Laudian Statutes which related to the studies in the higher faculties, and even to those studying for B.A., soon became obsolete; and eventually a few months' residence was all that was required between B.A. and M.A. For the majority, the real education of unendowed students ended with the B.A. degree. Even in the case of Fellows, excuses for non-residence came to be more and more freely accepted. By the end of the eighteenth century it had come to be understood that, at least after taking his M.A. degree, a Fellow was allowed to be resident or non-resident as he pleased, and nothing whatever interfered with the idleness of those who chose to stay in Oxford. At some colleges — especially All Souls and New College — the practice of "corrupt resignation," — *i.e.* a Fellow being allowed to take a bribe from a man who wanted to succeed him — added to the abuse by closing the fellowships to poor men.

(4) The area from which students would be drawn was narrowed by the close connection of the University with the established Church. The requirement of subscription to the thirty-nine Articles by every undergraduate at the age of sixteen, was not removed when religious toleration was established in the country at large. The fact that there was more religious liberty in England than in most continental countries, and consequently more dissenters from the State Church, only increased the number of the excluded. Moreover, as the Universities practically ceased to educate for the professions of law and medicine, the class which required a university education was smaller than elsewhere. The Church (in which the profession of the higher schoolmaster was virtually included) was the only career for which the University made any attempt to educate; and the medieval tradition remained by which a course in Arts was practically the only education received by the bulk of the clergy, though a few Divinity lectures were usually given to all undergraduates in college. The expensiveness of the colleges, except for the foundationers and the despised class of servitors, and their growing reputation for idleness and inefficiency aggravated the evil. They fell into disfavor with the more strenuous and progressive classes. The number of undergraduates at Oxford at the end of the eighteenth century was

much smaller than it had been at the beginning of it. By that time the benefits of a University education were practically confined to the future clergy, the sons of the landed gentry, and a very small section of the professional class which, with or without assistance from the foundations, could afford such a luxury before beginning their training for the bar (in England a very small profession), or medicine, or the like.

(5) The examinations prescribed by the Laudian Statutes had become a pure farce. The candidate was allowed to choose his own examiners; he could thus select a couple of young M.A.'s whom he entertained at a feast the night before. The examiners were expected to ask, and did ask, traditional questions, the answers to which the undergraduates had learned by heart from "schemes" or little books provided for the purpose a few days before the examination. The disputations and other conditions required for the degrees — higher and lower — had equally degenerated into the purest formalities when they were not "dispensed" by Congregation.

Revival in the Nineteenth Century. — To those who look back upon the condition of the University at the end of the eighteenth century the wonder is that the dry bones should ever have lived again. It is vain to speculate on the causes of the revival which first showed itself in the first years of the century: some may suggest the French Revolution, others the indirect effects of the religious revival which dates back to Wesley; or it may be that the very extremity of the disease awakened in the minds of a few able men a sense that something must be done to cure it. Certain it is that the eighteenth century was a period of progressive decay, the nineteenth century one of reform. The era of reform must be divided into two portions. During the first half of the century the reform came wholly from within; there was a revival of learning, of education, and of religion, with little change of machinery; what changes did take place were initiated by the University itself. During the second half of the century the reforms were largely imposed upon the University from without, *i.e.* by Parliament, at the instigation and with the assistance of a reforming party within, but in ways to which the University as a whole would never have consented.

Reform began in 1800 with the "new Examination Statute" which substituted a real Examination in place of the old pretence of one. Competent examiners were appointed by the University; a certain degree of proficiency was required for what was now called a "pass degree," while a list was published of those who had taken "honors," divided into two or (from 1808) three classes; a fourth class was added in 1831. There were two lists of honors — one of those who had distinguished themselves *in litteris humanioribus* (*i.e.* classics, ancient history, ancient and modern philosophy) and one *in Disciplinis Mathematicis et Physicis.* It is not too much to say that the improvement which soon began to take place in the industry of undergraduates, in the efficiency of the teaching and in the tone of life among the seniors has been chiefly due, directly or indirectly, to the stimulus supplied by these examinations, especially by the competition for honors between Colleges and individuals. High honors soon became so much esteemed by the general public that a First-class — still more, what was then called a "double first" (*i.e.* in classics and mathematics) — was supposed to mark a man out for distinction in Church or State, and the fact that he had taken one was still remembered to his credit when he had become a Prime Minister or an Archbishop. The number of "honour men" was at first small; they have now increased till they are more numerous than the "pass men."

Owing perhaps in part to the new examinations, a few Colleges began to attend, as they had never done before, to merit in the election to fellowships and scholarships. Balliol laid the foundation of its future distinction by opening its scholarships to competition among all comers. Oriel did the same with its fellowships; and an Oriel fellowship became the blue ribbon of the University. The growth of the "first Oriel school" — a group of men of mildly rationalistic or liberal tendencies — is the first sign of reviving intellectual life. Bishop Copleston (Provost 1814–1828), Archbishop Whately, and Bishop Hampden are its best remembered representatives. They were soon succeeded by the "second Oriel school," from which sprang the religious movement in the Church of England known as the "Tractarian" or "Oxford" movement, which began about the year 1833. (See KEBLE, JOHN; NEWMAN, JOHN HENRY.) Reactionary as were its intellectual tendencies, the movement did lead to a revival of serious theological study; and, if it absorbed the tutors in theological controversy too much to make for educational efficiency, it at least produced a higher standard of personal behavior and tutorial duty; while its increasingly Roman tendencies stimulated a liberal reaction which was in sympathy with the growing demand for University reform outside. When Newman joined the Roman Catholic Church in 1845, this liberal tendency was powerfully reënforced. "If any Oxford man had gone to sleep in 1840 and had woke up again in 1850," says Mark Pattison (*Memoirs*, p. 244), "he would have found himself in a totally new world. In 1840 we were in Old Tory Oxford, not somnolent because it was fiercely debating, as in the days of Henry IV, its eternal Church question. . . . In 1850 all this was suddenly changed as if by the wand of a magician. . . . Very free opinions on all subjects were rife. . . . A restless fever of change had spread through the colleges — the wonder-working phrase 'University reform' had been uttered, and that in the House of Commons. The sounds seemed to breathe new life into us. We against reform! Why, it was the very thing we had been longing for; we were ready to reform a great deal — everything — only shew us how to set about it and give us the necessary powers."

Reform Period. — *University Reform Act,* 1854. — The exertions of the Reformers inside and outside the University at last led to an Act of Parliament which appointed a body of Commissioners with power to inquire and make recommendations for the reform of the University. They presented in 1852 a report which led to the University Reform Act of 1854. The changes introduced by this measure, or by the Executive Commission appointed under the act, may be thus summarized: (1) For the old "Hebdomadal Board" of Heads was substituted a "Hebdomadal Council," consisting of the Chancellor (nominally), the Vice Chancellor, the ex-Vice Chancellor, the two Proctors, and eighteen members elected by a new body called the Congregation — of whom six must be Heads of Houses, six Professors, six members of Convocation. (2) The new "Congregation" consisted of all resident Doctors and Masters; a new Statute has to be passed by this body before coming before Convocation, and the power of amendment is vested in this body alone. By (it is believed) a mere oversight the old Congregation of Regents — now known as the "ancient House of Congregation" — was not abolished, and remains the authority for the conferment of ordinary degrees and a few other formal purposes. (3) A certain number of new professorships were founded, and the endowments of old ones increased out of the revenues of certain Colleges. (4) In the Colleges most of the local restrictions for fellowships and scholarships were swept away, and it was provided that they should be filled by public competition. (5) The religious test was removed as regards undergraduates and bachelors, but it remained for the degrees which secured admission to the governing body of the university. It was not till 1871 that "tests" were abolished for all degrees except those in Divinity, for fellowships, and for all University and College offices except those confined to clergymen.

Internal Reforms. — Reforms from within now began to follow one another with great rapidity. In 1852 the classical course was broken up into two sections: (1) An examination known as the First Public Examination, popularly known as "Moderations" because conducted by "Moderators," which was almost purely classical, taken in the course of the second year, and (2) the final examination, to which the name of *Litteræ Humanoribus* was now confined, which was less classical and admitted a larger element of philosophy and ancient history than the old, undivided School. A similar division was effected between purely mathematical "Moderations" and a School of Mathematics and Physics. Other honor examinations or "Schools" (implying fresh courses of study) now began to be founded; their names up to the present are as follows, with dates of the first examination in each case: natural science (1853); law and modern history (1853, broken up into two separate schools in 1873); theology (1870); Indian languages (1887), Semitic languages (1892), now united as a school of Oriental languages; English literature (1898); modern languages (1905). Numerous changes have taken place in the Pass School, in which a large number of "options" is now allowed. The first stone of the University Museum was laid in 1855, and has been followed by a succession of buildings to meet the requirements of students in natural science and medicine.

University Commission, 1881. — The next great legal change in the organization of the University was effected by an Act of Parliament passed in 1877, and by the Statutes of a Commission appointed under the Act, which were made in 1881. The changes which now took place were of a more sweeping kind than in 1854: (1) The Latin statutes (mostly medieval) of the Colleges were repealed; concise and businesslike English statutes were substituted for them, while an easy method of subsequent amendment (by Order in Council on the petition of a College) was provided. (2) The life tenure of fellowships — a feature almost peculiar to Oxford and Cambridge among medieval Universities, and the source of their worst abuses — was abolished. Elections were now to be for seven years in the case of non-resident or "Prize" fellowships, while Fellows engaged in educational work were to hold their fellowships — subject to periodical reëlection — as long as they discharged the duties. Power was also given to elect to fellowships persons engaged in "research." (3) The requirement of celibacy (which had been to some extent modified for particular Colleges by special enactments of the late Commission) was abolished, subject to provision securing the presence of a certain number of unmarried Fellows to reside in College. (4) All clerical restrictions upon the election to headships and fellowships (with the exception of Christ Church, whose Head was also Dean of the diocesan Cathedral, and one other College) were now removed, except in the case of one fellow (occasionally two or three) who were usually left for the conduct of the College services and the provision of theological instruction. (5) Further professorships were endowed, and the endowments of existing professorships increased by the annexation of a fellowship in one of the Colleges to the respective chairs, and by the imposition of further payments upon the College revenues. (6) Other payments for University purposes were imposed upon the Colleges (when their revenues were sufficient) in proportion to their wealth. (7) The value of fellowships — hitherto very variable — was reduced to a uniform £200 or (in some cases) for fellows engaged in teaching £300 per annum.

Other Reforms and Institutions. — The effect of these changes was to transform the University from a medieval and largely clerical institution, or group of institutions, into a modern University, and the body of College Tutors into an independent and permanent profession. But the changes which were introduced by private and extra-legal action on the part of the Colleges before and after the Commission of 1881 were quite as important as any which appear upon the face of the Statute-book. Private arrangements between a small number of Colleges for combined or intercollegiate lectures began about the year 1870, and were gradually extended until virtually all honor-lectures throughout the Colleges were open to the whole University. The College Tutors were thus relieved from the burden of too many lectures on too many subjects, which had been one main cause of tutorial inefficiency. The College Tutors were in fact transformed into a body of supplementary University teachers. The arrangement eventually obtained a semiofficial recognition from the University, and a recent Statute (1911) has now definitely organized the whole body of College Tutors and Lecturers into "Faculties," who elect representatives to sit and vote with the Professors as members of Faculty Boards. As a consequence of this change and of the general widening of intellectual interests, the old style of lecture, which was mainly a construing lesson, for the most part disappeared, and what used to be called the "professorial" manner of lecturing took its place. At the same time, by a spontaneous but rapid evolution, a system developed under which the College Tutor imparted instruction chiefly by hearing and discussing essays with single pupils or two or three pupils together. The practice appears to have become common somewhere in the second quarter of the nineteenth century — and was soon expected of every Tutor; it now constitutes the most characteristic feature of Oxford education.

A few other recent changes may briefly be mentioned: (1) In 1868 it was made possible for students to keep the statutable residence for degrees, and to obtain at small expense the benefits of University study without being members of a College or Hall; there are now some 250 "non-collegiate students." (2) In 1863 the University undertook, jointly with Cambridge, a system of examination for schools (under a joint Schools Examination Board), and in 1873 a system of local examinations (senior and junior) for boys and girls, — chiefly intended for those who do not intend to proceed to the Universities, — which has had a marked effect in improving the efficiency of the secondary schools throughout the country. (See EXAMINATIONS.) (3) In 1879 women began to be admitted to College lectures and, by private arrangement with the examiners, to some of the examinations. The names of women first appeared in a supplementary official class list in 1893. Nearly all the examinations are now open to women, but Convocation has so far refused to admit them to the actual degree. Four Halls for the residence of women students have been provided: Somerville College (1879); Lady Margaret Hall (1879: Church of England); St. Hugh's Hall (1886); St. Hilda's Hall (1893). (See WOMEN, EDUCATION OF.) (4) A system of "University Extension" for providing lectures of a University character in towns throughout the country was instituted tentatively in 1878 and definitely in 1885; while in 1909 a system of "Tutorial Classes" for the more thorough instruction of workingmen students was established by the University in consultation with representatives of the trade-unions. (See UNIVERSITY EXTENSION.)

The growth of special studies which could not conveniently be made the subject of an Honors School has led to the organization of various courses which do not lead up to a degree. The institution of the Rhodes Scholarship by the South African millionaire, Cecil Rhodes, sometime Prime Minister of Cape Colony, which enables a large number of American, Colonial, and German students, often somewhat older than the bulk of English undergraduates, to study in Oxford, has tended in the same direction, and stimulated a demand for "postgraduate" education. (See RHODES SCHOLARSHIPS.) The presence of a small number of former students in the "tutorial classes" also constitutes a body for which the ordinary curriculum is unsuited. These new demands have in part been met by the institution of a number of diplomas accessible after a shorter course of study than is required for the Degrees. The following courses leading to Diplomas have so far been instituted: anthropology; archæology; economics and political science; forestry; geography; rural economy; scientific engineering; and the theory, history, and practice of education.

Present Problems. — How far the revolution of 1881 and the changes consequent upon it have done all that is required in enabling the University to meet the educational requirements of modern England is a question about which opinions are at present divided. Inside and outside Oxford there are those who would like to reduce the Colleges to mere boarding-houses, to pool their revenues, and completely to reorganize the University on the German model. There are, of course, conservatives who would alter nothing or be content with the smallest amount of change which would avert a new Commission. There is an intermediate school — representing perhaps the largest section of the resident teachers of the University — who would retain the "tutorial system" as the most characteristic and the most successful feature of the present organization, while they recognize the necessity of considerable changes, not so much in the way of another violent revolution from without as to give the actual working part of the University the power, which it at present lacks, of reforming itself. Without attempting a discussion of proposed remedies, it may be convenient briefly to notice the features of the present system most subject to criticism: (1) The University is governed in an extraordinary and (except at Cambridge) unparalleled manner. Through the changes in the method of taking the B.A. degree, nothing has been done to make the M.A. a reality; that degree is still accessible to the B.A.'s of a certain standing and on the payment of fees without any examination. Even "Congregation" — composed of resident M.A.'s — includes many casual residents in Oxford who may have taken no more than a pass degree, and have no official position in the University or any College, while the supreme governing body of the University still consists of all M.A.'s, resident or non-resident, who qualify by the payment of a small fee. A summons from the conservative wirepullers in Oxford can always be trusted to bring up a few hundred Masters — largely country clergymen — to defeat the schemes which have commended themselves to the majority of the teaching body. The rejection of a proposal to abolish "compulsory Greek" in Responsions for students intending to graduate in mathematics or natural science is the most recent exploit of this legislative mob. (2) Although of late years an increasing number of fellowships have been bestowed upon persons engaged in educational work or "research," a considerable number of non-resident or "idle" Fellows remain. Whereas with the reformers of 1881 one of the chief objects was to use the fellowships as a means to starting men in professions instead of providing inducement to "hang about" Oxford, it is now widely felt that this was not the purpose for which Universities and Colleges were endowed. (3) A large portion of College revenues is devoted to granting scholarships — mostly of £80 for four years — often to the sons of more or less wealthy parents. (4) The Commissioners of 1881 — elderly men educated on the old system — had little sympathy with the modern conception of a University as an institution not only for teaching, but for the promotion of research and learned work. In the subjects largely studied by undergraduates there are some two or three Professors for twenty or thirty College teachers engaged in the same study. These men are often so hard worked that they have insufficient leisure to do anything considerable in the way of research and learned production; the chances of succeeding to a professorship, even at fifty or sixty, are small, and there is little other encouragement to such work. Further, the College Tutors begin their work too early and without adequate preparation, — often in the very year after they have finished their own B.A. course. (5) There are complaints of the tyranny of examinations. Some would like to supplant or supplement them by the requirement of "dissertations" and the more direct training in the methods of original research which such a requirement would stimulate, while others would prefer to provide for the encouragement of such work by postgraduate study. (6) There is a want of coöperation and coordination between the various University authorities concerned with finance, and between them and the Colleges. (7) There are the long-standing complaints as to the expensiveness of the Colleges, and the virtual exclusion of poor men from their advantages. Among the most advanced reformers it seems to be considered that University and College revenues should chiefly be devoted to the support and education of workingmen students.

The return to power of a Liberal Government, with an enormous majority at its back, in 1906 stimulated the outcry for University reform. The moderate reformers within the University were encouraged to make an effort for such "reform from within" as would avert the necessity for a Commission. The present Chancellor, Earl Curzon, seconded their efforts and published a book in which he made various suggestions. Reforms for legislation more or less on the lines proposed by him have been introduced by Council. Some of them have been rejected; others are still under discussion. The great obstacles to reform from within are the fact that some of the changes most generally demanded — such as a diminished expenditure on non-resident Fellows and scholars who can come to the University without assistance — require a unanimity among twenty independent governing bodies which has so far not been secured, while the cumbrousness, ultraconservatism, and ignorance of the ultimate governing body of the University make it improbable that any considerable proposals for reform will pass into a Statute, even when they are recommended to them by a leading conservative statesman whom they have themselves elected to the headship of the University. If this article is maintained, parliamentary intervention is sooner or later inevitable. Meanwhile reformers may console themselves with the reflection that now, as in the past, some of the advances most needed in the studies, the teaching, and the general tone of Oxford may be — and to a large extent are being — carried out by the silent development of public opinion among that much criticized body of men, the College Tutors, who are still taking the largest share in the real work of the University.

There are now 57 professors of the University, over 50 university readers and lecturers (but some of these are also college tutors, etc.), nearly 200 college tutors and lecturers, and nearly 3000 undergraduate students in residence, and about 150 resident B.A.'s still largely engaged in study. The number of women students in Oxford (unmatriculated) is 341. H. R.

See Student Life; Degrees.

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PACIFIC, COLLEGE OF THE, SAN JOSÉ, CAL. — An institution of higher learning situated in College Park, halfway between the towns of San José and Santa Clara. The institution was the pioneer Protestant college of California. The first charter was granted in 1851, and the school was opened in Santa Clara, May 21, 1851. In 1871 it was removed to its present location. The college owns a tract on the Alameda, which will be used for the erection of other college buildings. Though previous to 1911 a university in name, the institution has never attempted to do more than college work. However, in the decade of the fifties it established the first medical school in the state. This school later became incorporated as the Cooper Medical School of San Francisco, which in time was acquired by the trustees of Leland Stanford Junior University. Throughout its history the college has been under the patronage of the Methodist Episcopal Church, but is in no sense sectarian. As early as 1852 the college voted to admit women to its courses. As integral parts of the institution until June, 1911, were the preparatory and music and art departments. On the date named these departments were separately organized under the same president and trustees, and are now known as College Park Academy and Pacific Conservatory of Music and Art, respectively. The library and laboratory facilities are such as to enable students to pursue thoroughly all the regular college courses and to do the fundamental work looking toward higher special training in the professions, teaching, and engineering. Entrance and graduation requirements are equal with those of the other colleges and universities of the state. The college faculty numbers twenty-two. The enrollment in the college is 134, and in College Park Academy and Pacific Conservatory 210, making a total of 344. J. W. H.

PACIFIC UNIVERSITY, FOREST GROVE, OREGON. — Was organized in 1854 under Congregational auspices, but it is not subject to denominational control. Tulatin Academy, out of which the college developed, was granted a charter in 1849. Rev. Sidney H.

Marsh, D.D., was its first President and remained at the head of the institution for twenty-six years. Pacific University is frankly a college and makes no university pretensions, but because of legal difficulties is still required to use the original title. It requires fifteen units for entrance, and a full four-years' course for the Baccalaureate degree. It confers the degree of M.A. for one year of graduate work above the A.B. course and the presentation of an acceptable thesis. The total value of campus and buildings is $198,000 and the cash endowment is $245,000. The faculty numbers twenty-seven, and there are 250 students in all departments. W. W. P.

PACIOLI, LUCA (also **PACIUOLO**). — Mathematician, known from his birthplace as Fra Luca di Borgo San Sepolcro. He was a prominent writer on mathematics about the year 1500. The name appears in one of his works as Pacioli, but the family name was Paciuolo, so that both spellings are given in the histories of mathematics. He was born at Borgo San Sepolcro, in Tuscany, about 1445, and died in 1515. He was the first man in modern times to publish in printed form a noteworthy general treatise on mathematics, the *Sūma de Arithmetica Geometria Proportioni et Proportionalita*, written in Perugia in 1487 and published at Venice in 1494, a second edition appearing posthumously in 1523. He went to Venice in 1464 and acted as a tutor in the household of a wealthy merchant, remaining there until 1471, when he went to Rome. About this time he entered the Minorite order, but continued his work as a teacher. In 1476 he wrote a work on mathematics for his pupils in Perugia, but it was never printed. In 1481, while teaching at Zara, he wrote another, but that is also lost. It is probable, however, that the essential features of both of these works appeared in his *Sūma* of 1494. From 1471 to 1476 he traveled extensively (*per diuersi paesi ce conuenuto peregrinando*, as he says) and may possibly have gone to the Orient. His *Sūma* is a large treatise, containing about all that was known of algebra, geometry, and arithmetic at the time it appeared. From 1496 to 1499 he was teaching in Milan, and in 1497 he wrote his *Divina Proportione*, publishing this at Venice in 1509. He also published an edition of Euclid (Venice, 1509). Other manuscripts of his are extant, but no others have been published.

D. E. S.

PACKARD, FREDERICK ADOLPHUS (1794–1867). — Founder of American Sunday School journalism; graduated from Harvard College in 1814, and engaged in journalism and public life. He was editor of the *Sunday School Magazine*, the *Sunday School Journal*, and the *Youth's Penny Gazette*. Besides numerous articles on Sunday School teaching, his publications include *Union Bible Dictionary* (1837), *The Teacher Taught* (1839), *The Teacher Teaching* (1851), *Life of Robert Owen* (1866), and *Public Schools of the United States* (1866). W. S. M.

See Sunday Schools.

PADERBORN, UNIVERSITY OF, WESTPHALIA, PRUSSIA. — Established by Prince-Bishop Theodore of Fürstenberg in the year 1614. Like a number of other German universities, it owed its origin to a Jesuit college, such an institution having been founded in Paderborn in 1592. The university consisted only of a theological (Catholic) and a philosophical faculty, and belongs to the group of the institutions of higher learning that were disbanded in the early part of the nineteenth century, its doors being closed in 1819.

R. T., Jr.

See Jesus, Society of, Educational Work of.

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PADUA, UNIVERSITY OF, ITALY. — A *studium generale* was established at Padua in 1222, although it may be that law was taught there in the twelfth century. The immediate cause of the origin of Padua University was the secession of the students and professors as a result of dissensions with the city authorities. But that matters were not so satisfactory at Padua is indicated by a contract of 1228 between students and the city authorities to move to Vercelli. From this it appears that already at that date there were from 2500 to 3000 students at Padua, and this university was not affected in spite of the migration of a number to Vercelli. Between 1237 and 1260 a decline set in, and the university practically ceased to exist owing to the tyranny of the Ezzelini. A second migration from Bologna gave Padua a new start, statutes were drawn up, and a Papal Bull was granted in 1264 by Urban IV and was confirmed in 1346 by Clement IV. The municipal authorities contributed largely to the success of the university. The most important faculty was for a long time the legal; grammar, rhetoric, and medicine grew up gradually. In 1363 a theological faculty was sanctioned by Pope Urban V. Padua reached the highest point of her fame and success in the fifteenth and sixteenth centuries and even surpassed Bologna. It was an important center of the Renaissance studies and on that account attracted many foreign students, although the law students still predominated. In the eighteenth century the university declined rapidly and did not attain to any importance until the nationalization of Italy, although efforts were made to revive it under the Austrian rule. There are at present the following faculties: law; medicine and surgery; mathematical, physical, and natural sciences; philosophy and letters. Besides these there are schools of engineering and pharmacy, and a course for training of teachers. The enrollment in 1910–11 was 1383, of whom 400 were in the faculty of law.

See Italy, Education in.

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PÆDAGOGIUM. — See Hall.

PAGE, DAVID PERKINS (1810–1848). — Leader in the normal school movement and author of the most popular educational book published in the United States; born in Epping, N.H., the 4th of July, 1810. He got his schooling in the district schools of New Hampshire and at the Hampton Academy. At nineteen years of age he began his career as teacher at Newbury, Mass., and three years later he was elected vice-principal of the high school at Newburyport. His address on "Duties of Parents and Teachers," read before the American Institute of Instruction in August, 1838, Horace Mann declared the finest educational paper that had been read before that association during its eight years of existence. During the next six years Page contributed regularly to the *Common School Journal* edited by Horace Mann, and took an active part in the various educational meetings organized by Mr. Mann in Massachusetts and Henry Barnard in Connecticut.

With the opening of the normal school at Albany (the first in New York) in 1844, Page was selected as principal upon the hearty recommendation of Mann and Barnard. But the new institution met with a storm of opposition. "The newspapers ridiculed and denounced it. They invented all kinds of falsehoods about Mr. Page, and in many ways misrepresented the school and its work. The politicians were against it, and the teachers of the state had no love for the school or its Massachusetts principal." With each session of the state assembly the politicians endeavored to abolish the school; but Mr. Page visited all the chief cities of the state and explained the purpose of the normal school. "His presence carried conviction and won allegiance. His speeches turned the tide, and public sentiment favored the school." But he exhausted his physical powers in his efforts to save the school, and he died in his thirty-eighth year on the 1st of January, 1848.

Mr. Page took an active part in institutes and other educational gatherings in New York State as he had previously done in Massachusetts. Horace Mann remarks concerning his public lecturing, "He possessed that rare quality, so indispensable to an orator, the power to think standing on his feet and before folks."

Besides the essay on "Duties of Parents and Teachers," 6000 copies of which Horace Mann had printed and distributed to the teachers of Massachusetts, Mr. Page's only published writing is his *Theory and Practice of Teaching*, published in 1847. "No other book on the subject of education," writes Albert E. Winship, "has been read by so many American teachers through so many years." At the time of the expiration of the copyright (1889) more than 100,000 copies of the book had been sold; and with the expiration of the copyright three new American editions appeared. Probably no other American book on education has so much claim to be considered a classic. W. S. M.

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PAGE, EDUCATION OF THE. — See Chivalric Education; Gentry and Nobles, Education of.

PAIDOLOGY. — See Child Study.

PAIN. — This is now regarded as the sensation that arises on stimulation of a particular point or nerve end on the skin. It was earlier thought to arise from overstimulation of any sense organ. According to von Frey there are on the average from 100 to 200 pain spots to the square centimeter. They are about ten times as numerous as the pressure spots, and are about 1000 times as difficult to excite. That pain spots are distinct has been shown, not merely by mapping the spots, but also from the fact that there are certain tissues (the conjunctiva and cornea) where there are pain spots but no pressure spots, and others (the inside of the cheek) where there are pressure spots but no pain spots. Von Frey conjectures that the free nerve endings are the sense organs of pain. W. B. P.

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PAIN AND PLEASURE. — See Epicureanism; Hedonism.

PAINTING. — See Art, Study of.

PALACE SCHOOLS. — That type of schools which in imitation of the Palace Schools of Charles the Great were frequently attached formally or informally to the courts of kings or the households of nobles. See Alcuin; Charlemagne and Education; Gentry and Nobles, Education of; Guarino, dei Guarini; Renaissance and Education; Vittorino da Feltre.

PALÆSTRA (παλαίστρα). — A school intended for the physical training of boys, over the age of seven, which played an important part in Greek education (*q.v.*).

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PALEOBOTANY. — See Botany.

PALEOGRAPHY. — See Textual Criticism; also Library Service, Training for.

PALEONTOLOGY. — The scientific study of the phenomena of life of past geological ages. See Geology.

PALERMO, ROYAL UNIVERSITY OF. — See Italy, Education in.

PALMER, ALICE FREEMAN (1855–1902.) — President of Wellesley College; born at Colesville, N.Y., the 21st of February, 1855. She entered the Windsor Academy in 1865 and graduated in 1872. That year she entered the University of Michigan, where she graduated in 1876. Miss Freeman was called to Wellesley College as professor of history in 1879; two years later she was elected vice president of the college, and in 1882 she was chosen president. This position she held until her marriage with Professor George H. Palmer of Harvard University in 1887. From 1892 to 1894 she was dean of the women's department of the University of Chicago.

Mrs. Palmer held numerous incidental educational posts during her brief but brilliant career. From 1889 to the time of her death she was a member of the State Board of Education of Massachusetts and gave considerable time to the reorganization of the state normal schools. She was active in the councils of the Collegiate Alumnæ Association. From 1888 to the time of her death she was one of the trustees of Wellesley College. She was one of the directors of the Columbian Exposition at Chicago in 1893. She was president of the Woman's Home Missionary Association, and a member of the board of trustees of the International Institute for Girls in Spain.

W. S. M.

See Wellesley College.

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PALMIERI, MATTEO. — See Renaissance and Education.

PALSGRAVE, JOHN (*d.* 1554). — English divine, who enjoyed the favor of Henry VIII and was appointed by him tutor to Princess Mary (the king's sister) and later to Henry Fitzeroy, Duke of Richmond (the king's natural son). Palsgrave had studied at Cambridge, Paris, Louvain, and Oxford. He was the author of the earliest work giving the rules for the pronunciation and grammar of the French language and a French-English and English-French dictionary. The title of the work, which appeared in 1530, and was printed by Richard Pynson, was *Lesclaircissement de la Langue Francoyse, compose par maistre Jehan Palsgrave, Angloys, natyf de Londres et gradue du Paris.* The work is still of value as a storehouse of obsolete English words and phrases. Another pioneer work of Palsgrave was the translation for school use of a Latin play into English. This was the *Acolastus* of G. Fullonius, published under the title *Joannis Palsgrave, Londoniensis, Ecphrasis Anglica in comoediam. Acolasti. The Comedy of Acolastus translated into our English tongue after such manner as children are taught in grammar school, first word for word, as the Latin lieth, and afterwards according to the sense and meaning of the Latin sentences;* etc. In the dedication (to Henry VIII) Palsgrave attacks the prevailing method of translating good Latin into bad and barbarous Latin, " instead of pure English words and phrases." He wishes to see " such an established marriage between the two tongues as may be . . . an incredible furtherance to attain the pure Latinity by."

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PAMPHLETS. — See Tracts, Educational.

PANAMA CANAL ZONE. — Little or no facilities were provided for education in the Canal Zone before the work was taken over by the United States. Spanish schools had existed at Panama and Colon, and under the French a few colored teachers had been imported to look after the children of the laborers; but as the French had no right of government in the district, little progress was made. With the arrival of Americans, however, the demand for school facilities soon made itself felt, but little progress could be made before more pressing needs such as buildings for dwelling houses were satisfied. By 1907 there were twenty-five school buildings (eleven for white and fourteen for colored children) in nineteen towns, with twenty-one white and eighteen colored teachers. By 1909 the number of schools had increased to twenty-nine in twenty-one towns (twelve schools for 675 white children, and seventeen schools for 1417 colored children). There were in 1909 thirty-five white teachers, all with two or more years of successful experience in the United States or the Canal Zone beyond the four years of high school and two of normal school. The teachers are divided into four classes, receiving respectively $50, $60, $90, and $100 salary per month. In the colored schools teachers are almost all obtained from Jamaica and belong to the third and fourth classes. The schools are under the control of the Division of Schools which appoints a superintendent. Two supervisors, one for primary grades and one for grammar grades and high schools, are charged with the duty of unifying the work in all the schools and keeping up a uniform standard. The school term is nine months, from October 1 to June 30, with the usual intermissions. In 1909 medical inspection was introduced for white children. The government supplies free textbooks and stationery. School libraries were first established in 1907 from the proceeds of school entertainments. The curriculum in the grades consists of reading, English, spelling, arithmetic, geography, history, music, calisthenic, and Spanish (from the fifth grade up). In 1908 school gardens were introduced, and it is proposed to add agriculture and horticulture to the curriculum. The chief problems in the Canal Zone are the difficulty of maintaining uniform standards where the schools are so small and scattered. When the schools were first established, instruction was practically individual; since that time graded classes are found generally. Transportation and consolidation have been introduced both for elementary and high school pupils, *e.g.* at Ancon and Colon. A uniform course of study, which required careful consideration in order to meet the local situation, is also in use. Another difficulty is the grading of pupils who are drawn from every state in the Union and to secure the coöperation of parents who bring so many different ideals with them. Irregularity of attendance was also one of the large problems; the parents were frequently moved about along the zone and in many instances climatic conditions prevented regularity, while among the colored and native peoples it was no easy task to secure regularity without compulsory attendance laws.

In 1907 there were five high school pupils and in 1908 this number rose to twenty, when two schools were established, at Culebra and Cristobal; another was added later at Gatun. In 1909 the three schools together had an enrollment of only forty-three. The curriculum includes algebra, geometry, physical geography, general history, botany, English, German, French, Spanish, and Latin. Four subjects are normally carried by each pupil. But the defects and drawbacks incident to small schools are obvious and the proposal to centralize the schools and transport the pupils was carried through in 1910; in this way one larger main school, employing more teachers and approaching the standard of an ordinary country high school of the States, has been established at Gatun, with a branch or subsidiary school at Ancon, giving first and second year work. The first high school commencement was held at Gatun on June 24, 1911, and there were two graduates.

The growth of the Canal Zone system is illustrated in the following statement (from *Hearings concerning Estimates for the Construction of the Isthmian Canal for the Fiscal Year 1913*, conducted on the Canal Zone by the Committee on Appropriations, House of Representatives, Sixty-second Congress:—

[Figures for 1911 show net enrollment of pupils; for previous years, gross enrollment.]

	Pupils			Teachers			Buildings		
	White	Colored	Total	White	Colored	Total	White	Colored	Total
October —									
1906			[1]840			[1]21			[1]18
1907	176	1565	[1]1741			[1]30			[1]30
1908	721	2146	2867	23	20	43	11	14	25
1909	745	1067	1812	37	21	58	11	66	27
1910	931	906	1837	[2]40	[2]25	[2]65	9	15	24
1911	1076	903	1979	[3]45	[3]27	[3]72	11	[4]15	[4]26

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[1] Approximate; no annual report.

[2] Number authorized Oct. 31, 1901. During that month there were, respectively, thirty-seven and twenty-four teachers employed.

[3] Number of teachers authorized Oct. 31, 1910. During the month there were, respectively, forty-three and twenty-four teachers employed.

[4] Includes new four-room colored school building being erected at Ancon.

PANSOPHISM. — See Encyclopædism.

PANPSYCHISM. — See Monism.

PANTÆNUS.—See Catechetical Schools; Clement of Alexandria.

PANTHEISM. — The philosophic or theological theory, according to which God and the Universe are identical. It has both a mystic and a rationalistic form. Spinoza is generally regarded as the typical classic example of a pantheistic philosopher. In the development of modern idealism (*q.v.*) in its absolute form, thought or will or sentiency has often been taken to be the single ultimate reality manifested in both the physical world and the finite centers of consciousness that know and feel this world. These forms of absolute idealism have generally been criticized as pantheistic by their opponents. This claim has been denied by the absolutists on the ground that instead of merging individual selves as unreal in one absolute, they have held that a kingdom of selves is necessary to the reality of the ultimate thought or will. Fichte (*q.v.*), however, was not averse to the epithet ethical pantheism, provided it was understood to stand for the unity of will from which all diversity of individual moral striving took its departure and in which it found its goal. J. D.

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PAPE-CARPENTIER, MME. MARIE (1815–1878). — French educator. Although having enjoyed only a common school education, and only just passed twenty years of age, she was offered the direction of the *Salle d'asile* (to a certain extent the precursor of the present *école maternelle*, or kindergarten) at La Flêche (1835). While in a similar position at Le Mans, she published her *Conseils sur la direction des salles d'asile* (1845), which led to her appointment (1848) as head of the newly founded *École normale maternelle* in Paris, which was intended to supply trained teachers for kindergartens. This position she held for twenty-six years. Mme. Pape-Carpentier was one of the first to appreciate that the *salles d'asile* should be something more than mere nurseries, that they had certain educational possibilities; and their subsequent development was due in no small measure to her personal efforts, as well as to her writings. Among her more important works are: *Conseils sur la direction des salles d'asile* (1845), crowned by the Academy; *Enseignement pratique dans les écoles maternelles* (1848); *Conférences pédagogiques faites aux instituteurs réunis à la Sorbonne* (1867); *L'union scolaire ou organisation économique de l'instruction primaire* (1869). F. E. F.

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PAPER. — See Reading, Hygiene of.

PAPER CUTTING AND FOLDING. — See Kindergarten, Manual Training.

PAPPUS, or PAPPOS. — One of the prominent writers on geometry among the later Greek scholars. Little is known of him save that he lived in the fourth century of our era. His greatest work was his *Mathematical Collections* (Μαθηματικῶν συναγωγῶν βιβλία), a treatise that seems to have been in eight books, but of which only six are extant. The first Latin edition appeared in 1588, and with changed title pages in 1589 and 1602. There was a second edition published at Bologna in 1660. Pappus treats, in this work, of various geometric problems, including the duplication of the cube, measurements of solids, the sphere, geometric analysis, and mechanics.
D. E. S.

PARABLE. — See New Testament, Pedagogy of; Symbolism in Education.

PARALLELISM, PSYCHOPHYSICAL. — A general doctrine employed both in philosophy and psychology in the discussion of the relation between mind and matter. In philosophy, this doctrine was fully developed by Spinoza. He taught that all reality has two phases or aspects, one being the psychical or mental, the other the material. He uses the figure of the two sides of any flat or curved surface, and holds that there is a mental aspect corresponding to the upper surface of the body and a physical aspect corresponding to the lower surface. The two series of facts are parallel or complementary to each other at every point.

In psychological writing, the doctrine differs from the philosophical doctrine of Spinoza above described. The psychological use of this doctrine can be understood only by referring to the difficulties which arise from the effort to show any causal relation between physical facts and mental facts. The physicist holds that there is no loss of energy in the world through changes in the distribution of energy of motion. When, therefore, light arouses a sensation, the physicist cannot accept any doctrine which would hold that physical energy has been transformed into psychical energy, since such a transformation would tend to reduce the amount of physical energy in the world. In view of the attitude of the physicists in this matter, psychologists have found some difficulty in accounting for the relation between mental processes and physical facts. They have, therefore, been content to recognize that there is a parallelism between the two groups of phenomena and have been willing to postpone or leave as entirely insoluble the determination of the exact nature of this relationship. In this form, the doctrine of psychophysical parallelism simply evades the difficulties above referred to. Mental facts and physical facts can now be discussed under this general doctrine without going into the metaphysical problem of the ultimate relation between the two sets of facts.

Several questions might arise at this point. Is every physical fact always paralleled by some mental fact? Those who answer this question in the affirmative and hold that there is a complete parallelism between the two sets of facts are sometimes called "panpsychists." On the other hand, most psychologists are satisfied to limit the assumption of parallelism to those cases in which there is some obvious psychological advantage in the study of this parallelism. Sensation processes and thought processes, which depend upon cerebral activity, are evidently included under such cases. Whether the vibrations of the molecules in a stone are accompanied by conscious processes is a purely speculative problem which has no significance for the psychologist.

Certain writers have confused the metaphysical and the psychological interpretation of this doctrine, and have attempted to make it appear that the psychologists who wish to avoid by the adoption of this doctrine all metaphysical discussions are in reality denying certain metaphysical relations such as relation of causation. Such a contention is, however, wholly unjustified, as will be found by a reference to the writings of Wundt who is one of the foremost defenders of this doctrine in psychology. (See his *Outlines of Psychology*, p. 360.) C. H. J.

See PSYCHOLOGY.

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PARALYSIS. — The lack of the ability to move one or more parts of the body. These paralyses are of single muscles, of groups of muscles, or of small or large segments of the body. The paralysis may be the result of injuries to or destruction of very different parts of the nervous system. There are those which result from the injury or destruction of the peripheral nerves; those which result from the section or disease of the anterior roots of the spinal cord; those due to disease or injury to the spinal cord itself; and those which are due to the destruction of parts of the brain.

The paralyses are of great interest on the educational side, since they limit the activity and, consequently, mental capacity of the child. The paralyses of infantile type (those which are due to injury of the nerves in the arm or legs produced at the time of birth) may not be discovered for some time, until all power or possibility of regeneration of the nerves has passed away. Besides these, however, the paralyses in childhood are mostly curable, since they are due most often to injuries of the external part of the brain, and of the peripheral nerves, many of which may be treated with good effect by surgical means. The education of the paralyzed must be carried on in quite a different way from that of normal individuals; the means must be adapted to the individual equipment. The child with right arm monoplegia or with an hemiplegia cannot, under any conditions, be taught to write with the right hand, although some gross movements of that side may be possible. Insistence on a special form of enunciation is also out of the question with certain kinds of facial paralysis. Each case, however, must be considered in itself, and it is impossible to lay down any special rules to apply to every type of paralysis.

Very often anesthesia (*q.v.*) gives much the same result as the paralysis itself; because of the lack of the sensory stimulation, parts may not be moved, they become paretic and sometimes immovable. It is for this reason that abnormal individuals of this class should be given a careful medical examination, and the teacher should have all of the facts, medical as well as educational, upon which to base her training methods.

Paralysis is sometimes used as the equivalent of general paralysis of the insane, or paresis (*q.v.*), but is not correctly used in this sense. The term palsy is often used as the equivalent of paralysis, especially when the nerves are involved. S. I. F.

See INFANTILE PARALYSIS.

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OPPENHEIM. *Textbook of Nervous Diseases* (translated by Bruce). 1911. Vol. I, pp. 423–528; 667–697.

Reference Handbook of the Medical Sciences. 1903. Vol. VI, p. 484.

PARANOIA. — A mental disease characterized by systematized delusions and, except in this particular, exhibiting no mental degeneration. A number of years ago the major part of those admitted to hospitals for the insane were diagnosed paranoiacs, but most of these were undoubtedly suffering from other diseases in which similar symptoms are found. The paranoid (or paranoia-like) complex consists of the systematized delusion (*q.v.*), and this is present in many cases of dementia precox, or alcoholism, of manic-depressive insanity, and even of paresis. The distinguishing characteristics of paranoia are the chronicity and the lack of mental deterioration, and these conditions are found in only a few cases showing the paranoid complex. Since the term paranoid has not been discussed in the article dealing with dementia precox (*q.v.*), and on account of its widespread use, it needs further consideration.

As in most of the psychoses, there is at first a period of depression, nervousness, and vague feelings of discomfort. This stage is followed by self-introspection, and by endeavors to bring the actions of others into line with these feelings. This leads to the reference of one's feelings, actions, and thoughts to others. Many paranoiacs do not passively undergo the believed persecutions, but appeal to the neighbors, to the police, etc.; they go to law; they commit crimes and breaches of the peace. Throughout most of this period there are hallucinations of hearing; voices often tell the patient what to do, what power and position he has, etc.

In the usual paranoid state the systematization is less complete. True paranoia begins early and is progressive. Paranoid states may occur at any time, and may disappear when the occasion for the beliefs disappears. It is now believed by some that the paranoid state, in all forms, depends upon peculiar characteristics of the individual reaction, viz. the introspective, shut-in characteristics, and that these give a cue for the understanding of the abnormality. Whether or not this be the true explanation of all cases, it undoubtedly plays a part in many, and the conception is helpful in directing attention to the relatively frequent child who may need more of the teacher's effort in a social way. Such children should be encouraged in every way to come out of themselves, and to become a part of the community; they should be encouraged to take part in mass plays and in games in which they may act successively as leader and subordinate, and their attention should be attracted largely to things outside of themselves. S. I. F.

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PARAPHASIA. — A special form of aphasia (*q.v.*) in which the patient uses wrong words to express ideas. S. I. F.

PARASITIC DISEASES. — See INFECTIOUS DISEASES.

PARENTAL SCHOOL. — See REFORMATORY EDUCATION AND SCHOOLS.

PARENTHOOD. — See PARENTHOOD, EDUCATION FOR.

PARENTHOOD, EDUCATION FOR. — During the early stages of the child-study movement, there was much debate regarding the needs of parents for the proper upbringing of their children. Considerable literature appeared on the general topic, "Child study for parents," in which the view was presented that the parent's relation to his children must be *naïve* for the most part. The terms "instinctive," "spontaneous," and "common sense" appear very frequently in this literature. Nevertheless it was recognized that it would be of advantage to parents if they could be made familiar with the more important requirements for the healthful physical development of children, and for their moral training. At the same time, many persons who were not in sympathy with the new movement declared that any deliberate study of his child would be a handicap rather than a help to a parent, since it would make him more of an observer and a student than an affectionate guide and counselor. From 1890 to 1895 a number of prominent educational men denounced the efforts being made to induce parents to form child-study societies with a view to acquiring what was known regarding the nature of the child and his needs for sound development. Many maintained that parents would derive greatest help from the pursuit of such "cultural" subjects as history, literature, and art, which would enable them in their association with their children to give them the inspiration which was said to emanate only from these sources. On the other hand, the men and women who had inaugurated the child-study movement were, and still are, most diligent in their attempts to encourage parents as well as teachers to study the child in some such way as they would investigate any object with a view to determining its nature and the best methods of dealing with it. As a consequence of these efforts, there is to-day a widespread belief in this country, and also in England, and to a lesser extent in Germany, France, and Italy, that all who deal with children would be aided in their work if they could be made familiar with what is established respecting the native tendencies of the young, and their physical, intellectual, and social needs. This interest, as it is related to education for parenthood, is expressed in a variety of institutions and organizations.

Institutional Education. — In our own country and in England there has been a considerable demand from various parents' organizations during the last decade that studies dealing with requirements for efficient parenthood should be offered in high schools, normal schools, colleges, and universities. There are as yet, however, no courses in any of the groups of institutions mentioned which aim directly at training for parenthood. An examination of the curricula of many high schools in all sections of the country, and an inquiry made of a large number of the principals of these schools, indicate that pupils therein have manifested no interest in courses for parenthood, and would probably not pursue them if they were offered. In a very few instances, where high schools attempt to train teachers, certain topics relating to the nature of the child are discussed in the courses in psychology. But it is probable that the students in these classes acquire little, if anything, which relates specifically to the problems of parenthood.

An examination of the curricula of the normal schools throughout the country shows that no attention is given to effective education in the home. The psychology presented in these schools is for the most part analytic, adult psychology. In eighteen normal schools, courses are described which deal with the development of the child mind, as distinguished from the functioning of the adult mind. But this instruction refers particularly to the needs of the teacher rather than to those of the parent. And as in the high school, so here the instruction given in methods of teaching is not at all suited to the conditions, opportunities, and needs in the home.

One might expect that some attention would be given to the study of parenthood in women's colleges; but with two exceptions, possibly, there is no work whatever offered in these colleges bearing directly on any of the problems of parenthood.

The Mississippi State Industrial College (for women) at Columbus has begun to reorganize its curriculum and its work with a view to training girls specifically for home responsibilities. A plan has been projected in which every girl will be required to pursue courses pertaining to the nature of children, their physical care and intellectual development, and their ethical and moral training. The plan provides for cottage life for the students, so organized that each girl before she graduates will be required to manage a cottage in all details as a typical home, including the care and culture of childhood. This work will be required before a degree will be given.

While no work in the universities anywhere is designed mainly as a training for parenthood, there are still courses which relate to the nature and education of the child, in the home as well as in the school. Seventy-one important colleges and universities at present offer well-organized courses under such titles as "child study," "genetic psychology," "psychology of the child," "mental development," and "adolescence." In several universities a study of the child from birth onward is included in the general subject of "principles of education." Although the emphasis in these courses is not laid upon the parent's rôle in the education of the child, nevertheless much of what is presented relates quite directly to parental problems. It should be added that a large proportion of the colleges and some of the older universities offer no work relating to child nature. Even in the courses in psychology, no reference is made to child psychology.

An inquiry made concerning the interests of the students who elect such subjects as "child study," "mental development," and the like, shows that these courses are not chosen primarily as a preparation for parenthood. They are conducted, with but rare exceptions, in the department of education, and are pursued by students who are candidates for teachers' positions. It is worthy of remark that in the domestic science departments of the agricultural colleges, in which much attention is given to the making of a home in respect to the purchase and preparation of food, the sanitation and decoration of the home, and so on, little if anything is said regarding the traits and education of children. Such questions, however, are frequently considered when these agricultural colleges hold conventions of women who live on the farm.

In all the kindergarten training colleges courses are conducted which pertain to the nature of the young child, and the method of his instruction and entertainment. For the most part these courses are presented in the spirit of Froebelian philosophy and in metaphysical terminology. It is probable that on the theoretical side they do not deal very closely with the actual manifestations of child life in the home; but on the practical side they appear to present helpful methods in directing the child's activities. In this way they may be of substantial aid to a parent in the training of his child. In the Chicago Kindergarten College a definite course for parents has been organized for the purpose of discussing matters pertaining to the spiritual and physical nurture of children, such as the direction of the child's activities in the home, children's failures and how to utilize them, the treatment of the child's questions, the meaning of imitation in the child, and so on. Practical lessons are given on the value of stories, games, and handwork in the development of the child. Lectures are also given on eugenics, including heredity, sex development, infant mortality, and kindred matters. These courses are offered to mothers and students free of charge. Two hundred students were enrolled in these courses in 1911–1912. This work has attracted attention, not alone in Chicago, but in other cities also, and there is an indication that similar courses will soon be instituted elsewhere.

The Stout Institute at Menomonee, Wis., now a state institution, offers similar work. So far as can be ascertained, the Institute is exceptional in respect to the attention which is given to studies pertaining directly to parenthood.

It is of special importance to note that in several of the Chicago elementary schools "Little Mothers' Classes" are being conducted on Friday afternoons. The girls are taught the duties of motherhood, and, wherever possible, babies are used by nurses to exemplify the work. This work is done by the nurses who regularly visit the schools.

No courses are offered in educational institutions in any foreign country aiming directly at preparation for parenthood. Much is being accomplished in the study of child life in Germany, and to a less extent in France, England, and Italy; but most of what has been established has not yet reached parents at all. At the present moment, though, there is lively activity, in Germany and England especially, in the formation of societies and congresses for the dissemination of knowledge pertaining to the child.

The National Congress of Mothers. — Undoubtedly the most effective organization in the world to-day for the development of interest in the rational care and culture of the child in the home is the National Congress of Mothers, established in the United States in 1897. At the present time, this Congress has in the neighborhood of 75,000 members, distributed throughout the country, and the list is increasing rapidly. Nearly all the states have congresses affiliated with the National Congress. There has been organized under the Congress a National Parent-Teacher Association, and an International Congress on the Welfare of the Child. The latter Congress meets every third year, and it is designed as a medium for the dissemination throughout the world of the ideals for which the Congress of Mothers is working. The Parent-Teacher Association has become an integral part of the National Congress. In the original statement of the purpose of the Congress, emphasis was laid upon the aim of educating parents so that they might intelligently care for their children physically, and direct their spiritual development. Coöperation of the home with the school was also made prominent in the work of the Congress. Further, it was the purpose to promote the establishment of kindergartens, and to secure legislation which would adequately care for neglected and dependent children. It was stated that the Congress would seek to secure proper training of young people for the opportunities and duties of parenthood.

During its fourteen years of existence the Congress has worked effectively towards the accomplishment of these aims. As it has developed, it has broadened its original purpose, and it now gives attention to such matters as the establishment of juvenile courts (*q.v.*) and probation associations, the development of schools for teaching the deaf, the education of parents in respect to the evils resulting from child labor, propaganda with regard to the use of the schoolhouse as a social center, the establishment of public playgrounds, the introduction of manual training and domestic science into the school curriculum, coöperation with farmers' institutes for the betterment of children in the country, and the like. The Congress has also been active in the formation of parents' clubs and societies in foreign countries. In 1906 it established the *Child Welfare Magazine*, in which a prominent place was at first given to scientific literature dealing with child nature and the training of children. Latterly, however, there have appeared in the magazine articles of a more practical character, written usually by parents who have become distinguished for their helpful suggestions relating to the training of the young.

The affiliation of Parent-Teacher Associations with the Congress of Mothers has changed somewhat the original character of the latter, the tendency now being to give attention quite largely to questions pertaining to child welfare in its legal and social aspects, as well as to the care and training of the child in the home.

It is apparent that the National Congress of Mothers, through its great number of affiliated state congresses, local mothers' circles, parent-teacher associations, and its International Congresses on the Welfare of the Child will exert an increasing influence throughout the world for the betterment of child life, not only in the home, but also in the school and in the community. The chief problems presented to the Congress now seem to have reference to the scientific character of its work. It is seeking to make a scientific treatment of parental problems attractive to persons who are untrained in scientific methods and ways of thinking, and those who are directing its work appear to have the situation thoroughly in hand.

The Parents' National Educational Union. — This organization, modeled in considerable part upon the National Congress of Mothers, is an English society. The Union seeks to treat the development of the child and his training from the physical, mental, moral, and spiritual standpoint. It aims to reach fathers as well as mothers, and its efforts are not limited to the people of any class. It endeavors to collect and disseminate the best available information relating to the training of children and to bring about the coöperation of parents in any community for the interchange of their views and experiences. There are many branches of the central Union; and while they are designed particularly for parents, still any person who declares his interest in education may enroll as a member. The organ of the Union is *The Parents' Review*. The Union has also established a library for the purpose of lending books and articles pertaining to home education to parents and any others who may be interested. Finally, it conducts a Mothers' Educational Course which is designed to be a reading course relating (1) to the methods of religious education, (2) the care and development of children in sickness and health, (3) the study of the principles and methods of education, and (4) particularly to the development in children of an interest in nature. The course is designed to be systematic, and to be completed by an examination.

Another English association similar in aim to the Parents' Union, but not so comprehensive in scope, is the Child Study Society, London, which concerns itself with the "scientific study of the mental and physical conditions of children, and also of educational methods." Its organ is *Child Study*.

International Congress on Home Education. — In 1905 an International Congress on Home Education was instituted in Belgium under the direction of the Belgian government. At this first meeting twenty-four different governments were represented, and 1200 delegates were in attendance. About 250 specialists in the countries represented contributed papers pertaining to childhood and child welfare, and these were published in seven volumes. Although not circulated extensively in English-speaking countries, they have played a considerable rôle in developing in continental Europe an interest in the psychology, pedagogy, sociology, and biology of child life. Since the first International Congress, which was held at Liège, there have been two others, — one at Milan in 1906 under the patronage of the king of Italy, and the other at Brussels in 1910 in connection with the Universal Exhibition. It has just been decided to hold the fourth International Congress at Philadelphia, in 1914. The Congress consists of five sections: (1) The study of childhood, (2) the education of children, (3) abnormal children (4) various subjects relating to children, and (5) literature.

International Congress on Pedology. — As some of the members of the International Congress on Home Education believed that its scope was too comprehensive, there was established in 1911 at Brussels an international congress for the purpose of bringing together persons interested in the scientific study of child development. It is composed largely of psychologists, psychiatrists, educationists, and persons of kindred interests.

It is not at all improbable that during the next few years most of the national and international congresses which are now being formed will become merged into two or three general organizations, which will centralize all the activities relating to the study of childhood.

Child Welfare Exhibits. — During the winter of 1910 an exhibit was held in New York for the purpose of showing in as concrete a way as possible by means of photographs, symbolic representations, lectures, and living demonstrations the actual conditions of child life, and practical methods of conserving the health and improving the morals of the young. The exhibit proved to be so successful that it was transported to Chicago, where it was enlarged and presented during the month of May, 1911. As a result of the success of these two exhibits, plans are in preparation for similar exhibits in a number of cities of the country. So far as can be ascertained, no vital criticism has been passed on the usefulness of such exhibits. It seems apparent that the general plan of exhibiting the facts of child life in a concrete, dynamic way will meet with increasing favor, and be adopted by communities in every part of the country.

These exhibits present pictorially and in living demonstrations facts pertaining to child life in the home, on the street, in the school, in the church, in the theater, in the public library, in clubs, in associations, on the playground, and in amusement halls. Lectures are also given by competent persons upon every phase of child life treated in the exhibit.

Educational Departments of Women's Clubs. — Visitors to America from foreign countries generally express surprise at the thoroughgoing way in which the women here are organized for educational purposes. In most communities there is at least one woman's club, the purpose of which is to enable its members to participate in the intellectual, social, educational, and philanthropic activities of the community. Originally the women's clubs gave their attention largely to literary and artistic pursuits, but latterly they have undertaken to study in a careful way the life of the communities in which they are situated, with a view to suggesting improvements therein. These clubs are usually conducted under various departments, one of which is concerned with education. A program is prepared by the educational department at the beginning of the year which relates either to the training of children in the home, or to the improvement of educational conditions in the school and of child life in the community. In some instances the members pursue courses of reading in connection with the various topics discussed.

It seems evident that the influence of women's clubs is becoming constantly more potent for good in the betterment of conditions for the child in the home, in the school, and in society. There is a developing conviction among the members of these clubs that the chief work of women should relate to child welfare. In some cities, only those departments of the women's clubs that are concerned with one or another phase of civic activity arouse much enthusiasm in the members. These clubs have already in many places secured important reforms in respect to the curriculum and the physical conditions of the schools, and the life of children in the community. They have secured public playgrounds, gymnasiums for the public schools, and similar reforms.

Parents' Meetings in Public Schools. — During the past decade, teachers in the public schools in every section of our country have been active in attempts to interest the parents of their pupils in the work of the schools, and in matters pertaining to the proper care of children. It is the practice in most places to give exhibitions or receptions to which parents are invited, and as a part of the program educational topics are discussed. From reports received, it is evident that the meetings have been successful in informing parents regarding new developments in school work, and in securing support from the community in regard to the extension of educational advantages, such as the establishment of gymnasiums, the improvement of the hygiene of public schools, the securing of playgrounds for school children, and the like. In this work it has been necessary everywhere for teachers to take the initiative; and so far as it has been possible to secure data for this article, it is apparent that the success of parents' meetings has been dependent almost entirely upon the efforts of teachers. However, responses received to a questionnaire regarding the value of parents' meetings in the public schools indicate that in communities in which these meetings have been held for several years parents are taking a more intelligent interest in the work of their children in school than they did formerly. Reports have come from a number of communities saying that as a result of the meetings parents now frequently visit the public schools, and coöperate with the teachers in securing needed improvements which require financial support from the community.

Eugenics Clubs. — There is beginning to be manifested in some communities a lively interest in the subject of eugenics (*q.v.*). In some cases the women's clubs have taken up a discussion of this topic. Eugenics clubs have been formed for the purpose of considering the requirements for the improvement of the race through the betterment of the conditions of childhood, both before and after birth. An examination of the programs of some of these clubs shows that the topics considered relate directly to problems of parenthood. In at least one state, Iowa, the Federation of Women's Clubs and the Mothers' Congress have taken definite steps to make a careful study of the subject of eugenics. A woman physician has been sent abroad to find out what progress has been made there in the study of the subject. It is proposed to develop a method of "scientific scoring" of children in some such a way as horses, cattle, and corn are now scored in agricultural colleges. The physicians of the state worked out a standard which was applied to a large number of babies, and included items pertaining to height, weight, measurement, condition of teeth, of eyes, of nerves, and so on. Apparently the exhibit at the Iowa state fair attracted favorable attention, for it has been repeated in one form or another in a number of communities in the state. M. V. O'S.

See Child Labor; Child Psychology; Childhood, Legislation for the Conservation and Protection of; Eugenics; Family Education; Hygiene, Teaching of; Infant Education; Moral Instruction; Physiology, Teaching of.

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PARENTS AND SCHOOLS, LEGAL ASPECT OF. — See FAMILY EDUCATION; PUPILS' RIGHTS, DUTIES, AND OBLIGATIONS; PARENTHOOD, EDUCATION FOR.

PARENTS' MEETINGS. — See PARENTHOOD, EDUCATION FOR.

PARENTS' NATIONAL EDUCATION UNION. — See PARENTHOOD, EDUCATION FOR.

PARENT-TEACHER ASSOCIATION. — See PARENTHOOD, EDUCATION FOR.

PARESIS. — In a general sense a muscular weakness. It is also a name of a special neuro-mental disease which is popularly spoken of as "softening of the brain," and in a scientific way as "dementia paralytica" or "general paralysis of the insane."

The use of the term in its general sense indicating muscular weakness is that which is most general in neurological writings. The weakness may result from a variety of physiological and anatomical conditions. Those which are of most common occurrence, and which, consequently, are best known, are the pareses from disuse. When an individual does not utilize certain muscles, these muscles decrease in strength and also in coördination ability. Certain muscles of the body are commonly paretic, and practically paralyzed. The muscles moving the scalp and the ears are examples. They are seldom utilized; and when one endeavors to move the ears, for example, it is found that the movement is slight and of little force. The paresis due to disuse may be ameliorated by training, and a few attempts at moving the scalp and the ears will show how soon these muscles may be trained and how readily they acquire a considerable degree of force, because of the exercise.

A paresis may result from disease of the nervous system, especially from certain cerebellar affections. It is sometimes found in neurasthenia (*q.v.*), in psychasthenia (*q.v.*), and in hysteria (*q.v.*).

Although one of the principal methods of treatment of muscular weakness is educational, the presence of the condition is of much greater pedagogic interest. Exaggerated or premature feelings of fatigue, accompanied by an apparent muscular weakness, is evidence of one of the many diseases of the nervous system, and in this state no child is fit to carry on the ordinary school work. It is criminal to attempt to stimulate the child under these conditions; he should be treated as one who is ill and who needs rest and care more than the mental and physical exercise of the school day. Paresis in the sense of dementia paralytica is a disease appearing between the third and fifth decades. The disease is one in which the dementia becomes profound very rapidly, and death usually ensues within two years after the onset of the symptoms. S. I. F.

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For references to Paresis in the sense of muscular weakness, consult those under PARALYSIS.

PARESTHESIA. — An hallucination in the fields of the skin, muscle, joint, or organic senses, but commonly of a qualitatively different character from the normal perception of stimuli to these sense organs. Most of the paresthesias have not been analyzed psychologically, although they have a decided importance on account of their relation to the poorly understood organic sensations. A common paresthesic experience is that of the foot or leg "going to sleep." This is caused by pressure on the nerve trunks in the upper part of the leg or at the angle of the knee, and the sensation or perception is referred to the lower part of the leg. The feeling of the presence of an amputated limb is another similar paresthesic condition, due to some irritation in the nerve fibers which formerly supplied the limb that was amputated. The most common paresthesias are as follows: feelings of weakness, of debility, of faintness, of oppression, of weight or constriction, of tightness in the chest and inability to breathe, of heart constriction, of heart throbbing, of sinking, of flying, the bearing down feelings, formication (feeling of crawling ants), itching, tickling, (at times), furry feelings, numbness, tingling, some burnings, chilliness, the feeling of a part of the body "falling asleep," and the so-called girdle sensations. Many of these paresthesias are found in normal people, and cannot be considered to be distinctly pathological, although they reach their height and intensity in pathological conditions of the nervous system. The analyses of the paresthesias that are made indicate clearly the artificial division between the normal perceptions (*q.v.*), illusions (*q.v.*), and hallucinations (*q.v.*). S. I. F.

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PARIS, INTERNATIONAL EDUCATION AND CONGRESSES OF 1867, 1878, 1900. — See INTERNATIONAL CONGRESSES OF EDUCATION.

PARIS, SCHOOLS OF. — See FRANCE.

PARIS, UNIVERSITY OF. — For the historical account see UNIVERSITIES. For present status see FRANCE, EDUCATION IN.

PARISH AND PARISH SCHOOLS. — See PAROCHIAL SCHOOL SYSTEM AND PARISH SCHOOLS.

PARISH, ELIJAH (1762–1825). — Author of geography texts; graduated from Dartmouth College in 1785, and engaged in the ministry of the Congregational church. He published *New System of Modern Geography, Sacred Geography,* and with Jedediah Morse (*q.v.*) *Gazetteer of the Eastern and Western Continents* (1802). W. S. M.

PARISH SCHOOLS AND PAROCHIAL SCHOOL SYSTEMS. — The schools under the control of the church, and attached in some manner to the local system of parish churches. The historical position and character of these schools is discussed under a number of topics. The most important of these are CHURCH SCHOOLS; BISHOPS' SCHOOLS; CANON LAW AND EDUCATION; MIDDLE AGES, EDUCATION IN; and the REFORMATION AND EDUCATION. Previous to the Reformation the parish school was the most important and in many places, if not entire countries, practically the only elementary school. After the Reformation, the elementary school continued to be a parish school in most countries until the nineteenth century. In England it was a parish school in fact as in name, in that it was essentially a church-controlled institution. In other countries the school retained the name, the church retained much of its influence, but the authorized or legal control lay in the state. The development of these schools into state systems is treated in the important sections in the articles on the various national systems. See especially the articles on ENGLAND, EDUCATION IN; SCOTLAND, EDUCATION IN; GERMANY, EDUCATION IN. At the present time the parochial school, supported in whole or in part by the state, and controlled in whole or in part by the church, exists in many countries, especially those of dominantly Roman Catholic affiliation.

The parochial school becomes a problem especially in those governments which, like the United States and France, have severed completely the relation between Church and State and have removed substantially all state contribution to church educational efforts. Even in these countries the severance of these ties has not settled the problem connected with the question of church schools. For the recent experience and present status in France, see the article on FRANCE, EDUCATION IN. For the United States, the experience and present status on the legal side is discussed under BIBLE IN THE PUBLIC SCHOOLS. The pedagogical aspect is dealt with more directly in the articles on MORAL EDUCATION and RELIGIOUS EDUCATION. There have, however, grown up actual parochial school systems of great extent entirely independent of the public school system. While the chief of these is that of the Roman Catholic Church, several of the Protestant denominations support elementary schools, and one, at least, — the Lutheran, — has developed an extensive system. This is given in outline in the article on LUTHERAN CHURCH AND EDUCATION. The administrative aspects of the parochial school system of the Catholic church and the general position of that church regarding the relations of the public schools and the parochial school systems is given under the caption, ROMAN CATHOLIC CHURCH and the PUBLIC AND PAROCHIAL SCHOOL SYSTEMS.

The term "parish" is also used in the state of Louisiana for what is elsewhere in the United States termed "county," and is thus used in connection with educational administration. (See LOUISIANA, EDUCATION IN.)

PARK COLLEGE, PARKVILLE, MO. — A coeducational institution founded in 1875. Academic, collegiate, and music departments are maintained. The entrance requirements are fifteen units of high school work. The degrees of B.A. and M.A. are conferred in course. The enrollment of collegiate students in 1911–1912 was 227. The faculty consists of twenty-four members.

PARKER, FRANCIS WAYLAND (1831–1902). — American educational reformer; born at Bedford (now Manchester), N.H., Oct. 9, 1837. He received the rudiments of his education in the district schools and at a country academy. Later in life (1872–1875) he spent three years in study at the University of Berlin, Germany. From his sixteenth to his twenty-first year he taught in the district schools of New Hampshire. In 1858 he became principal of schools at Carrolton, Ill. With the outbreak of the Civil War he entered the service of the federal army, and before the close of the war had risen to the rank of colonel. From 1865 to 1868 he was principal of a grammar school at Manchester, N.H., and the next four years he taught in the normal school at Dayton, Ohio. Upon his return from Germany in 1875 he was elected superintendent of the schools at Quincy, Mass., which position he held for five years. For an account of his labors during this period, see under QUINCY MOVEMENT. From 1880 to 1883 Colonel Parker was one of the supervisors (assistant superintendents) of the schools of Boston. From 1883 to 1899 he was principal of the Cook County (Chicago) Normal School. In 1899 he accepted the principalship of the Chicago Institute, a pedagogic institution founded by Mrs. Emmons Blaine for the scientific training of teachers. One year before his death, this institution became the School of Education of the University of Chicago.

No American educator in modern times has done so much to modify and enrich the course of study in elementary schools. He was a lover of childhood and he had the insight to see educational problems from the standpoint of the child. He possessed extraordinary personal powers, and his own enthusiasm and earnestness were always contagious. These qualities enormously increased the attendance at the Cook County Normal School. Students flocked hither from all parts of the country, and particularly from the Middle West; and the enthusiastic and scientific teachers that he trained have done much to bring about the educational uplift of our own day. His success was due to his zeal and fondness for children, and openmindedness to whatever came to him from the world outside.

His educational publications include *Talks to Teachers*, *How to Study Geography*, *Course in Arithmetic*, *Talks on Pedagogics*, and a series of geographic readers entitled *Uncle Robert's Geographies*. For one year (1883–1884) he edited a monthly educational journal, *The Practical Teacher*. This journal contained essays by himself and his colleagues in the Cook County Normal School on the various aspects of elementary education. W. S. M.

See Quincy Movement.

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See also the Parker Memorial Number of the *Elementary School Teacher* for June, 1902.

PARKER, RICHARD GREENE (1798–1869). — Textbook author; graduated from Harvard College in 1817 and taught for many years in elementary schools. His publications include *History of the Grammar School in the East Parish, Roxbury* (1826), *Aids to English Composition* (1832), *Natural Philosophy* (1837), and with James M. Watson the National Series of school readers and the National spellers (completed in 1858). W. S. M.

PARKS. — See Playgrounds.

PARLEY, PETER. — See Goodrich, Samuel Griswold.

PARLIAMENTARY EDUCATION COMMISSIONS, ENGLAND. — The intervention of the English Parliament in national education through the agency of Royal Commissions forms a very important side of the history of English education. The earliest education commission was a body appointed to carry out the suppression of monasteries. (See Reformation and Education.) The second commission was that appointed under the statute for the abolition of chantries in 1547 (1 Edw. VI. 14). (See Chantry Schools.) The chantry commissioners missed a superb opportunity to reconstruct a system of education from the medieval material that was in their hands, though some of the old schools were refounded (see the *Yorkshire Chantry Survey*, Surtees Society, 1892, by William Page). The third commission was appointed under Statutes 39 Eliz. 6 and 43 Eliz. 4 and 9 whereby commissioners for charitable uses were appointed to deal with the misemployment of charitable gifts. This body proved very ineffective in consequence of there being a statutory right of appeal from its decisions, but it in fact reformed thirty-three important schools between 1601 and the beginning of the nineteenth century. The commission was abolished by statute in 1888. (See Chancery, Court of.) In 1649 the Commonwealth Parliament appointed a large commission to deal with education in Wales and Monmouthshire. The commissioners were intended to exercise both ecclesiastical and civil powers over schoolmasters. (See Commonwealth in England and Education.) We may note in passing that in 1687 a high commission was appointed by the Crown to deal with the obstinate refusal of the Universities of Oxford and Cambridge to admit Roman Catholics to University privileges, while in October of the same year a special commission was appointed to exercise visitatorial jurisdiction over Magdalen College, Oxford, and secure Roman Catholic predominance in the College. In 1695 the Greenwich Hospital Naval School was founded by a Royal Commission aided by the Register Act of 1696 (7 and 8 Will. III. c. 21). In 1788 the Irish Parliament passed an Act providing for the appointment of a Commission to consider the state of Education in Ireland (25 Geo. III. c. 15). In 1806 the Imperial Parliament passed an Act (46 Geo. III. c. 122) to inquire into "the general funds and revenues granted for the purposes of education, and into the state and conditions of all schools in Ireland." The first chairman of this commission (which presented fourteen Reports between 1806 and 1813) was the sixth Duke of Bedford, the father of the famous educational statesman Lord John Russell (*q.v.*). In 1824 another Irish commission was appointed that presented nine Reports. In 1831 a Permanent Irish commission on education was appointed and this commission received royal charters in 1845 and 1861. (See Ireland, Education in.)

In England a select parliamentary committee was appointed in 1816 to "enquire into the Education of the Lower Orders" which issued a report dealing with London in the same year. It was reappointed in 1818 and reported on the whole kingdom and declared that "the anxiety of the poor for education was daily increasing" in town and country alike despite the "neglect and abuse" of educational foundations and the fact that the education societies almost wholly confined their efforts to the great towns. The Committee also dwelt on the growing religious tolerance in the schools. The conscience clause (*q.v.*) was in fact already in operation. The committee advocated different methods for town and country; in towns a system of aiding schools by building grants (the system adopted in 1833) and in helpless country districts a system of practically rate supported free parochial schools (the system adopted in 1870). The report is a document of the first importance in the history of English education. This committee succeeded in passing an act in 1818 (58 Geo. III. c. 91) appointing commissioners to inquire into educational charities, who were appointed and reappointed until 1837. This commission dealt with endowments of the total value of £1,209,395. In 1835 a select committee recommended a permanent board of charity commissioners. In the same year the Poor Law Commissioners appointed under the Poor Law Act 1834 regulated the education of the pauper children. (See POOR LAW EDUCATION.) On August 17, 1833, the first parliamentary grant for education was voted. On June 4, 1834, a select committee of the House of Commons on education was appointed and a report consisting of evidence was issued on August 7. On March 3, 1835, a further select committee on education was appointed which reported with evidence only on August 3. On July 14, 1835, a select committee was appointed "to inquire into the best means of extending a knowledge of the Fine Arts and of the principles of Design among the people — especially the manufacturing population of the Country." The report of this committee (and of another formed in 1849) led to the formation of the Science and Art Department, which was brought under the Education Department in 1856. A third select committee on education was appointed on Nov. 30, 1837. It reported on July 13, 1838, and pointed out that voluntary effort alone was giving anything "worthy the name of Education" in large towns. The condition of the children in these towns was very serious, as they began work at the age of nine years. The position demanded, in the view of the committee, "some strenuous and persevering efforts to be made on the part of the Government if the greatest evils were not to follow." The committee insisted that daily educational provision must be made for at least *one eighth* part of the population; that special provisions must be made in poor districts; that the Treasury Grant System must be extended. On April 10, 1839, a permanent committee of the Privy Council was appointed to deal with National Education. This body by an Order in Council of February 25, 1856, became the Education Department, and this Department by an Act of 1899 became the present board of Education. In 1849 another Royal Commission on Charities was appointed under Lord Chichester which reported that "the evils and abuses are still in existence to a very wide extent, and no sufficient remedy has yet been provided for this correction" and again recommended a permanent body of Charity Commissioners. These commissioners were appointed by the Charitable Trusts Act of 1853, and their powers have since been completely regulated by Parliament. By the Education Act, 1899, the powers of the commissioners over educational endowments were transferred to the Board of Education.

In February, 1858, on the motion of Sir John Pakington, a Royal Commission, the Newcastle Commission, was demanded by Parliament "to inquire into the present state of popular education in England, and to consider and report what measures, if any, are required for the extension of good and cheap elementary instruction to all classes of the people." The commission was gazetted on June 22, 1858, and reported (under the presidency of the Duke of Newcastle) on March 18, 1861 with no less than fifty-one recommendations. It recommended that schools should be jointly supported by state grants and rate grants depending on the degree of knowledge attained by the children during the year preceding the payment of the grant. The schools would have to show eight square feet of superficial area for each child in average daily attendance. Special state grants were to be offered to schools with less than sixty pupils. The combined grants were not to exceed the fees and voluntary subscriptions combined, with an additional grant to stimulate regular attendance. The system was to be carried out by partly elected and partly coöpted County and Borough Boards of Education. Ministers of religion were also to sit on these bodies. The proposals of the commissioners were totally inadequate to meet the educational position, which was attacked in a different way, first by the Revised Code introduced by Mr. Lowe (*q.v.*) in 1861, next by Select Committees in 1865 and 1866, and finally by the statutory system of compulsory school attendance introduced in 1870 and 1876. In 1886 a Royal Commission, the Cross Commission, was appointed to inquire into the working of the Elementary Education Acts. It reported at great length in 1888 with a minority report by eight out of the twenty-three commissioners. Its recommendations as to raising school age, the development of evening schools, special help for rural schools, and the creation of undenominational training colleges have been largely carried out.

In 1861 a Royal Commission, the Public Schools, or Clarendon, Commission, was appointed to inquire into the nine leading public schools of the country (Eton, Winchester, Westminster, Charterhouse, Harrow, Rugby, Shrewsbury, — all boarding schools, St. Paul's and Merchant Taylors, day schools) which were then educating 2696 boys. The commissioners also dealt with Marlborough, Cheltenham, Wellington (boarding schools) and the City of London and King's College Schools, London, (day schools.) The commissioners reported in 1864, and in 1868 the Public Schools Act was passed. In 1864 another Commission, Schools Inquiry or Taunton Commission, dealt with the endowed schools and problems in secondary education not considered by the Duke of Newcastle's Commission of 1858 and the Clarendon Commission of 1861. The Schools Inquiry Commission included Frederick Temple, William E. Forster, Dean Hooke, and Sir Stafford Northcote, assisted by James Bryce, Matthew Arnold, and Joshua Fitch. Its report, issued in 1867, is of the greatest value in the history of English secondary education and contained a number of important suggestions for the improvement of the educational and administrative systems which were not adopted until the end of the century. This commission reported and stated that there were 572 endowed grammar schools at work with a net income of £183,016 and exhibitions to the annual value of £13,897. It was for this Endowed Schools Commission that Matthew Arnold reported in France, Germany, Switzerland, and Italy and advised the country to " organize your secondary and your superior instruction." The commission specially dealt with secondary education for girls. Their report led to the passing of the Endowed Schools Act, 1869 (*q.v.*), and the rapid multiplication of secondary schools for girls as well as boys created out of the old endowments. Under this Act, Endowment Schools Commissioners were appointed who before their powers passed to the Charity Commissioners in 1874 reformed and gave schemes to no less than 235 schools. The working of the Endowed Schools Acts was subjected to Parliamentary inquiry from 1884 onwards. In 1881 a Committee of the Education Department was appointed by the Government to inquire into the conditions of intermediate and higher education in Wales. This led to the Welsh Intermediate Act of 1889 and finally to the creation of a Welsh Department working in connection with, but independent of, the English Board of Education. In 1894 a Royal Commission, the Bryce Commission, was appointed "to consider what are the best methods of establishing a well-organized system of secondary education in England, taking into account existing deficiencies, and having regard to such local sources of revenue from endowment or otherwise as are available or may be made available for this purpose." The Rt. Hon. J. Bryce was chairman, and three of the seventeen commissioners were ladies. The Report in nine volumes, presented in August, 1895, recommended the appointment of a general Education Department under a Minister of Education and a Consultative Education Committee (one third appointed by the Crown, one third by the Universities, and one third coöpted), which should absorb the Charity Commissioners (as regards education), the Science and Art Department, and the Education Department. The creation of the Board of Education by an Act of 1899 in part carried these proposals into effect, while the Education Act, 1902, provided for the local organization of education to some extent on the lines suggested by the Royal Commission.

In 1901 an interdepartmental committee of the Board of Education and the Local Government Board reported on the whole question of the employment of children out of school hours. The practice was not altogether condemned. Legislation has followed. (See CHILDHOOD, LEGISLATION FOR THE CONSERVATION AND PROTECTION OF; CHILD LABOR.)

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PARMA, ROYAL UNIVERSITY OF. — See ITALY, EDUCATION IN.

PAROCHIAL SCHOOLS. — See PARISH SCHOOLS.

PAROXYSM. — A sudden attack and sometimes only an exacerbation of certain diseases. The term is also commonly used to indicate a spasm effect, *e.g.*, paroxysms of fear. See EPILEPSY; SPASM. S. I. F.

PARSONS COLLEGE, FAIRFIELD, IA. — A coeducational institution founded by Lewis B. Parsons of Buffalo, N.Y., who, in 1855, bequeathed the residue of his estate, amounting to $37,000, for the purpose of "endowing an institution of learning in the State of Iowa." In 1874 the citizens of Fairfield, coöperating with the Presbyterian Synod of Iowa, organized to secure the bequest, donating $30,000. The charter was received Feb. 24, 1875. Newly elected trustees are subject to confirmation by the Synod of Iowa. Sixteen members of the board and the president of the institution must be members of the Presbyterian church.

Buildings and equipment are valued at $220,000. The productive endowment is $229,000. The annual income from tuition and invested funds is $20,000. There are sixteen members of the teaching staff, eight of whom are professors. There are about 100 students in the College proper. The Academy maintains a four-year course under a separate teaching staff. The B.A., B.Ph., and B.S. degrees are granted. Advanced degrees are not granted. H. M. G.

PART-TIME ATTENDANCE AT SCHOOL. — **England and Wales.** — The system of part-time attendance or the half-time system has been particularly prevalent in England and Wales. A half-timer or partial exemption scholar is defined by the Board of Education as one " who is certified by or on behalf of the Local Education Authority to be qualified by age and attainments or previous attendance for employment in conformity with the by-laws." The problem of the half-timer is thus part of the greater problem of child labor (*q.v.*) which includes not only street trading and casual employment, but also the regular employment of school children out of school hours.

The half-time system arose with the factory and educational legislation which followed the industrial revolution. Its beginnings are found in the educational clauses of the Factory Acts of 1833 and 1844, which required children employed in factories to attend school half the day or so many days per week, but it was the Education Act of 1870 that firmly established the system. Under this Act was granted partial relief from compulsory attendance at school to children between the ages of ten and thirteen who had reached a certain standard of education. Although subsequent Education Acts (1876, 1880, 1893, 1899) have modified the conditions for exemption, the system of to-day is practically the same as that of 1870. Exemption may still be obtained by passing a " labor examination " varying in difficulty from that of Grade III to that of Grade VI, while since 1899, 300 attendances (morning or afternoon sessions) for each of five preceding years, not necessarily consecutive, have also sufficed. The qualification is, in many cases, absurdly low and is further complicated by the fact of local option. A city or county council may or may not pass by-laws permitting half time within its jurisdiction. Some cities, *e.g.* London, Birmingham, Plymouth, and Newcastle, have no half-timers; other towns, especially the textile towns of the North, have large numbers consequent upon low standards for exemption. Four half-timers out of every five are found in the factory districts of Lancashire and Yorkshire.

The following table shows the development of the half-time system. The figures, however, must be interpreted cautiously, because they represent the total numbers in any given year. The actual number at any given moment was, of course, much smaller. Thus in 1906–1907 the average number of half-timers was only 47,360, although the total for the year was 82,493.

Year	No. of Half-timers
1875–1876	201,284
1890–1891	173,040
1895–1896	119,747
1900–1901	74,468
1905–1906	81,981
1909–1910	75,758
1910–1911	71,475

The lowest number, previous to 1910–1911, was reached in 1900–1901. The upward turn taken at this time was due to the Act of 1899, which introduced the principle of exemption for attendance only.

The half-timer introduces many problems into school organization and administration. He is difficult to fit in with other children because he receives only one half the lessons. Lessons must either be duplicated for him, thus causing his classmates to mark time, or he must be neglected and allowed to fall hopelessly behind them. Attempts to segregate him have also proved futile. There are also certain moral and physical dangers connected with his employment. He learns " mannish " ways without developing manly control, with the result that he tends to become a nuisance in the home, the school, and the street. The strenuousness of modern industrial life also leaves its mark upon him; all the physical measurements that have been made show him to be the inferior of his school fellows in height and weight.

Yet many arguments are given in support of the system. It is said that the half-timer receives a good technical training in the workshop, that the requisite dexterity of fingers can only be gained at the early age of twelve or thirteen, that it is good to develop a spirit of independence, and so forth. On the other hand, it is pointed out that instruction is given in a haphazard fashion by any operative who happens to be his master or mistress for the time being, that the finger dexterity can be acquired equally well at fifteen or sixteen, that the wages earned ($.30 to $1 a week) are seldom of absolute necessity to a family, and that the employment kills off any desire on the part of the half-timer to continue his education at evening or technical classes. It must be acknowledged, however, that the system is extremely popular with the half-timers themselves. They, as wage earners, enjoy more independence and liberty at home, and they have a certain amount of pocket money to spend.

The system, which is opposed by the best elements in English life, is continued mainly by the inertia of custom, but is also fostered by the greed of non-thinking parents. An Interdepartmental Committee formed to inquire into the question of Partial Exemption from School Attendance reported, in 1909, in favor of its abolition. Although the government has never taken upon itself to end the system, it supported the bill of Mr. Walter Rea, February, 1912, which proposed to raise the age of exemption from twelve to thirteen and to refuse exemption to all children who are not beneficially employed. The bill has passed its second reading by a large majority (April, 1912) and, if facilities are given by the government, it should become law on Jan. 1, 1913.

P. S.

In the United States the part-time system exists only in a few cities, and there as a result of inadequate seating facilities. As these conditions are merely exigencies of rapidly growing communities, the system of part-time attendance has no significance. See New York City.

See England, Education in; Industrial Education.

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PARTIALITY. — See School Management.

PARTRIDGE, ALDEN (1785–1854). — Founder of military schools in the United States; graduated from the United States Military Academy in 1806, and for twelve years an instructor in that institution. For two years he had charge of the exploration of the northwestern boundary of the United States. He organized several secondary schools upon military principles, after the pattern of West Point, for boys not amenable to the milder discipline of the ordinary schools. One of the most important of the military schools that he organized was that at Norwich, Conn. (1820), which was incorporated as Norwich University in 1834. His publications include *Lectures on Education* (1825) and many papers on military subjects. W. S. M.

See Military Education.

PASCAL, BALISE. — See Port Royalists.

PASCAL, JACQUELINE (1625–1661). — French educator, younger sister of Blaise Pascal. While still in her early twenties, she tried in vain to persuade her father to allow her to enter a convent. After his death (1651), she became a nun, and was made submistress (1655) of the novices at Port-Royal (*q.v.*). In this capacity she was directly in charge of the education of the younger children, where she followed the method of training for which her brother was responsible, and she is deserving of no small portion of the credit for the success attained in this work with the younger classes. She stoutly resisted giving her assent to the Papal Bull against Jansenism, but in the end she was forced to yield and died of grief a few months later. Her most important writing was *Règlement pour les Enfants de Port-Royal* (1665). F. E. F.

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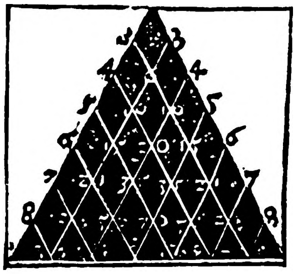
PASCAL'S TRIANGLE. — A triangular array of numbers known long before the time of Pascal (*q.v.*), but so extensively studied by him as to be called by his name. The numbers are written in this form: —

$$\begin{array}{llllll}
1 \\
1 & 1 \\
1 & 2 & 1 \\
1 & 3 & 3 & 1 \\
1 & 4 & 6 & 4 & 1 \\
1 & 5 & 10 & 10 & 5 & 1
\end{array}$$

and so on. Each number is derived by adding the number just above to the number at the left of the latter. The successive lines are evidently the coefficients of the various powers of a binomial, and the device has, therefore, considerable interest in the teaching of the binomial theorem. The triangle, or its substantial equivalent, first appeared in print on the title-page of a work by Apianus (or Bienewitz, 1495–1552), which appeared in 1527. The following is a facsimile of this first printed form.



D. E. S.

PASSION. — This term is used to designate strong or uncontrolled emotional states. From the point of view of education such uncontrolled states of emotion are significant as indicating a lack of training on the part of the individual. Children, especially those who are more or less abnormal, are likely to exhibit fits of passion such as anger or rage. The corrective for such uncontrolled expressions of emotion is very commonly some general treatment of the whole physical system. A sharp distinction should be drawn between such emotional states and voluntary activity. The whole matter may be referred to the general discussions of emotions. C. H. J.

PASSOW, FRANZ (1786–1833). — German philologist, was born at Ludwigslust, Mecklenburg, and studied at the University of Leipzig under Gottfried Hermann. In 1807, although not quite twenty-one years old, he was appointed professor of Greek literature at the gymnasium of Weimar. He owed this appointment to Goethe, who had met the young man and had been very favorably impressed by his enthusiasm for literature and classical antiquity. In 1810 he was called to direct the *Conradinum*, an educational institution in Jenkau, near Danzig. In 1815 he became professor of philology and archæology at the University of Breslau, where he remained until his death. In 1818 he became involved in the controversy which raged around the instruction in gymnastics introduced by Harnisch (*q.v.*). Passow, who was fond of physical exercise, strongly supported Harnisch, and published in his defense a book called *Turnziel* (*Aim of Gymnastics*), which nearly cost him his position. Attempts were made to remove him from Breslau, but his reputation as a scholar and teacher was too great. His chief work is his great lexicon of the Greek language (*Handwörterbuch der griechischen Sprache*), first published in 1819; a recent edition appeared in 1901. F. M.

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PASTORET, MME. DE. — See INFANT SCHOOLS.

PATHOLOGICAL PSYCHOLOGY. — See ABNORMAL; DERANGEMENT; INSANITY; PSYCHIATRY; PSYCHOPATHOLOGY.

PATHOLOGY. — See MEDICAL EDUCATION; also HYGIENE.

PATON, JOHN BROWN, D.D. (1830–1911). — Was born at Galston in Ayrshire. After attending the parish school he acted as usher in a private school in Gloucester; entered Springhill Congregational College with R. W. Dale, took his M.A. at London University with Gold Medal for Philosophy; became minister of the Wicker Church, Sheffield. In 1863 he was appointed first principal of the Congregational Institute at Nottingham, founded to provide training for pastors and evangelists of country churches. He felt the social influence of the church and throughout his life advocated the coöperation of all Christian churches in the "Inner Mission" for the healing of social evils and preached redemptive service. In 1870 and the following years he stood out against the policy of secularism in the public elementary schools under the new Act. He coöperated with Professor James Stuart in the early years of the University Extension Movement (*q.v.*), and the University Lectures at Nottingham led to the foundation of the University College (1881). Seeing the need of public education between the ages of thirteen and seventeen and the inadequacy of the old night school to supply the need, he started classes under the Nottingham School Board which combined recreative subjects with musical drill, stereopticon lectures, and practical handwork of all kinds. This led to the foundation of the Recreative Evening School Association (1885), which largely increased the numbers in continuation schools and paved the way for a new development of evening classes leading to higher technical and artistic education. Taking a hint from the Chautauqua Association (*q.v.*), he founded the National Home Reading Union (*q.v.*) (1889), which gives guidance and help for reading, private and associative. In connection with the Home Reading Union the first summer meeting in England was held at Blackpool, leading to the regular extension meetings at Oxford and Cambridge. He founded the Coöperative Holidays Association (*q.v.*) to provide cheap holidays in which working folk should have the companionship of university men and women. He founded at Longfield a Colony of Mercy (1895) on the model of Bodelschwing's Colony at Bielefeld for the practical training of unemployed and the educational care of epileptic and feeble-minded children, hitherto herded together with the imbeciles in the workhouses. He founded the Social Institute Union (1886) with a view to providing, for the most part in the Board School buildings, counter-attractions to the public house. He founded the Boys' Life Brigade, with objects and methods similar to the Boys' Brigade, but dispensing with all use of guns, and laying stress on ambulance work, fire drill, and all training for the saving of life. He also founded the Girls' Life Brigade and the Brigades of Service for young men and women. He was one of the moving spirits in the formation of the British Institute for Social Service (1904), the Christian Union for Social Service (1894), and the Scottish Christian Social Union (1901). He was chairman of a Vagrant Children's Protection Committee. He was much interested in the reëstablishment of the yeomanry on the land and founded a Coöperative Small Holders' Association and a Coöperative Banks Association. He was instrumental in adapting the Elberfeld systems of poor relief to English conditions and in the establishment of Civic Guilds of Help in large towns of England. He was joint editor of the *Eclectic Review* (1858 to 1861) and of the *Contemporary Review* (1882 to 1888).

In addition to numerous pamphlets he wrote: *A Review of Renan's Life of Christ*; *The Origin of the Priesthood*; *The Twofold Alternative, Materialism or Religion and the Church, a Priesthood or a Brotherhood*; *The Inner Mission of the Church*; two volumes of Collected Essays: *Church Questions of To-day* and the *Apostolic Faith and its Records.* J. L. P.

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PATRICK, ST. — See IRELAND, EDUCATION IN.

PATRIOTISM. — The feeling which moves the individual to identify with his own the interests of the social group to which he belongs, and to speak and act accordingly.

Origin and Development of Patriotism. — Sociology ascribes the origin of patriotism to the family life, the family being the earliest of the social groups. In primitive life support, protection, and authority were chiefly represented by the father; hence loyalty to the father was both natural and necessary. Fatherism was therefore the earliest form of patriotism. With the enlargement of the family into the clan, gens, and tribe, the interests of particular families were merged in the interests of the group of which they were component elements, and loyalty to the family passed over into clannishness or tribalism. With the amalgamation of tribes into states and nations patriotism enlarged into love of country, its most conspicuous form to-day.

Patriotism, then, originates in association, and association is the condition of its development. From this fact we may infer that, if political and social organization and amalgamation continue, patriotism will undergo a consequent transformation. A "Parliament of man and Federation of the world" would as certainly conduce to cosmopolitanism or political humanism as tribal association has produced tribalism, and the consolidation of states into nations has produced modern patriotism. Love of country would naturally give place to love of kind.

Instinctive Patriotism. — Patriotism, as here defined, is primarily a sentiment or feeling. This feeling is instinctive. Patriotism in which feeling is the predominant element may thus be called instinctive patriotism. Now it is characteristic of an instinct that it acts without reflection. Though originally purposive in action, and serving as an element in individual or group preservation, instinct takes no consideration of objective circumstances. It is blind impulse. When the stimulus is provided, it operates; and its operation has often led in the course of biological and social evolution to the destruction both of individuals and of groups. Patriotism, therefore, so far as it is merely instinctive, is impulsive, blind, unreasoning, and irreflective. It thrills, it hurrahs, it boasts, it fights and dies without calmly considering either occasion or consequence. It resents a fancied national insult without stopping to ascertain whether it is real. It flies to the defense of the supposed interests of its group without inquiring whether the danger is actual. It is blind patriotism and springs from the emotional side of the mind. It differs in no essential respect from the instinct of the tiger to defend its young, or from that of the wild cattle of the prairie to defend the herd. It is easily aroused and easily stampeded. It is a feeling for one's country uncontrolled by intelligence; zeal without knowledge. Under its promptings the patriotic is sometimes the idiotic. The utterances and actions sometimes evoked by it show that a man may be a patriot and still be a fool.

Obviously great national and social dangers may arise from manifestations of instinctive patriotism. As antipathy toward other nations, and consequent irreflective action, it provokes suspicion, jealousy, hatred, and unnecessary war. It inspires irresponsible and mischievous declarations with respect to other people, and sneering comments upon their customs and peculiarities, which tend to provoke hatred and hostility. As Chauvinism and Jingoism it prevents that national receptiveness which is so essential to progress. It is not eager to learn from other nations for the very simple reason that it thinks they have nothing superior to teach. To the instinctive patriot nothing in foreign nations is worthy of emulation or adoption. He speaks without the slightest reverence of "Japs" and "Chinks" and "Dagoes"; of "Wild Irishmen" and "Flatheaded Dutchmen." Such a "patriot" may be a gentleman so far as his more intimate personal relationships are concerned, but as a national representative he is often a braggart or a bully. No matter, then, how patriotic one may be, if one's patriotism is merely instinctive it is irrational and irresponsible, and consequently a danger to one's country.

In spite of the dangers of instinctive patriotism, however, it must be recognized that, like other instincts, it has served, and may again serve, a very useful purpose. Indeed, in the absence of social intelligence, it has been essential to the preservation of social groups. When, for instance, the life of a nation is in danger its citizens must rise instantly to its defense. There is no time for serious reflection. To deliberate is to be lost. Hence the social impulse of resentment and the disposition to spring to arms is an element of national survival; for it leads the citizens to act in concert and so more effectively. Without instinctive patriotism no group in a hostile environment could have survived. On the whole, those groups in which it was most highly developed are the ones which have persisted. Instinctive patriotism, then, has unquestionably been an element in social survival as well as in social danger and destruction. But, however serviceable it may have been in the past, or however necessary now in a critical national exigency, it is not the kind of patriotism which is most needed to-day. It involves governments in needless strife, and it renders citizens easily susceptible to the pernicious influence of kings, diplomats, and unscrupulous politicians. It should, therefore, be supplanted as rapidly as possible by the patriotism of intelligence.

Intelligent Patriotism. — It is the function and power of the intellect to inhibit, sometimes to eliminate, an instinct. Even the instinct of self-preservation, strong as it is, has sometimes been wholly inhibited by a duly informed and reflective mind. The proper intelligence may therefore modify, even reverse, the actions springing from instinctive feeling. Patriotic sentiment may be held subject to a thorough knowledge of political and social conditions and a sense of justice. When so held it becomes intelligent patriotism. Intelligent patriotism, then, is patriotic feeling, instinctive patriotism, under the control and guidance of knowledge and reflection. It is love of country and the disposition to serve it, coupled with a knowledge of how to serve it well. It does not yield to impulse, but controls it. It looks before and after. It restrains a nation from fighting when there are no real interests at stake. The difference between the two kinds of patriotism is practically the difference between impulsive action and reasoned action.

The Teaching of Patriotism. — With this distinction between the two kinds of patriotism it ought to be clear that in the effort to develop patriotism by means of education, emphasis should be laid not upon stimulating patriotic emotion, but upon increasing the factor of intelligence. As a rule, we may safely rely on the existence of patriotic feeling and devote attention almost, if not quite, exclusively to the promotion of knowledge appropriate to its control. Saluting the flag, the singing of patriotic songs, Fourth of July celebrations as usually conducted, to say nothing of the patriotic appeals from pulpit and rostrum, are directed primarily to stimulating the patriotic instinct. Emotional effects are thereby easily produced. Those who practice these methods really believe that they are developing patriotism, but they are merely inciting patriotic emotion without giving it the proper means of guidance. The really needed and difficult thing is to form the instinct of patriotism so that it will operate, even under trying circumstances, to the real advantage and safety of the nation. Education should result in imparting such knowledge of social history, civics, and ethics as will result in arousing a sympathetic interest in the merits and worthy achievements of all nations and races, a just pride in our own, and in the development of such habits of thought as will make patriotism, love of country, identical with loyalty and devotion to liberty, justice, and truth.

I. W. H.

See Citizenship, Education for; also, Character Education.

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PATRIZZI, FRANCESCO. — See Renaissance and Education.

PAULSEN, FRIEDRICH. — Born July 16, 1846, in Langenhorn, Holstein, and died in Steglitz, near Berlin, August 14, 1908. He attended the *Volksschule* of his native village, and was prepared by Pastor Thomsen for the gymnasium at Altona, a higher class of which he entered in 1863. After receiving the *Reifezeugniss* in 1866 he began the study of theology at the University of Erlangen in accordance with the wishes of his mother; but he was unable to throw himself into the work with any enthusiasm, and therefore changed to philosophy, taking also classical philology and history, with a view to the possibility of becoming a gymnasial teacher. From 1867 to 1870 he was a student at Berlin (under Trendelenburg, Harms, and Bonitz); and also at Bonn and Kiel. After receiving his degree in 1870, Paulsen spent the next five years at the University of Berlin, partly in rounding out his knowledge, devoting himself particularly to the study of experimental physics, chemistry, anthropology, economics, jurisprudence, and politics, partly in composing his *Habilitationsschrift, Versuch einer Entwicklungsgeschichte der Kantischen Erkenntnisstheorie.* From 1875 to 1878 he served as a private docent at Berlin, from 1878 to 1894 as extraordinary professor, and from 1894 to his death as ordinary professor of philosophy and pedagogy. It was his aim, as he himself declared, to bring philosophy into vital relation with the general culture of the day, regarding it as an indispensable element of our social life. He did not care to make converts to a system; he was opposed to all partisanship and faction. The mission of philosophy was according to him not to coerce men's thought but to set it free, to train them in independent thinking, not to make them passive recipients of philosophies. Towards the close of his life he appealed to larger circles of the German public through the spoken and written word; "whenever a question became a burning issue," as Professor Kaftan said, "a word was expected from him to help clear the air."

In the movement for the reformation of secondary education in Prussia, Paulsen took a leading part. He was opposed to the Order of Studies, dating back to Johannes Schulze, which made the classical gymnasium the normal and only type of secondary schools and the sole entrance gate to the various departments of the university, and insisted that the gymnasium, the realgymnasium, and the oberrealschule be placed on an equal footing. His recommendations, which had been ignored at the celebrated December Conference of 1890, were followed at the June Conference of 1900; the monopoly of the classical gymnasium was abolished. Paulsen also advocated freer methods of instruction in the upper forms, methods that would give greater scope to voluntary and spontaneous activity. "What Germany wants," he held, "is the Anglo-American college, which forms a very valuable transition stage between school discipline and the full freedom of German university life." Among his many valuable contributions to the literature of education, we mention the following books: *Geschichte des Gelehrtenunterrichts auf den deutschen Schulen und Universitäten* (2 vols., 1885 and 1896); *Das Realgymnasium und die humanistische Bildung* (1889); *Die deutschen Universitäten und das Universitätsstudium* (1902, trans. by Thilly and Elwang); *Das deutsche Bildungswesen* (1906, trans. by Lorenz); *Moderne Erziehung und geschlechtliche Sittlichkeit* (1908); *Richtlinien der jüngsten Bewegung im höheren Schulwesen Deutschlands* (1908); *Pädagogik* (ed. by Kabitz, 1911).

Paulsen's metaphysics, which shows the influence of Spinoza, Fechner, Lotze, Schopenhauer, and Kantian criticism, is a system of idealistic monism, panpsychism, and pantheism; the physical processes and the psychical processes are one and the same reality, perceived in different ways, the former through the mediation of the senses, the latter directly, as they are in themselves, in consciousness. In the physical sphere everything is mechanically conditioned, as natural science teaches; but the mental realm, which is the true reality, is a world of purposive activity. The material world is the outward expression of a universal consciousness, to which the individual consciousness, stands in the same relation as the particular human body to the universal system of bodies. This conception of the universe is set forth in the *Einleitung in die Philosophie* (1892, trans. by Thilly), a book which has passed through twenty-three editions. Paulsen's moral philosophy, as presented in his *System der Ethik mit einem Umriss der Staats- und Gesellschaftslehre* (1889, eighth ed., 1906, trans. by Thilly), has been characterized by him as teleological energism to distinguish it (1) from Kantian intuitionism and (2) from English utilitarianism. The end of the will is not feeling but action; the highest good is an objective content of life, consisting in the perfect exercise of all human mental powers, in which pleasure forms a part. The end or purpose realized by morality is grounded in the human will, is something toward which the will is essentially directed. In a later account, *Kultur der Gegenwart: Systematische Philosophie* (pp. 289 ff.), what was formerly called the individual's basal will is spoken of as the objective will; the system of objective morality is regarded as the product and function of a universal reason immanent in the social forms of historical life. He also wrote *Immanuel Kant: Sein Leben und seine Lehre* (1898, trans. by Creighton and Leferve), and collected many essays in *Gesammelte Vorträge und Aufsätze* (2 vols., 1906). F. T.

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PAVIA, UNIVERSITY OF. — See Italy, Education in.

PAYMENT BY RESULTS. — A system of apportioning public money for education based on the results of examinations. Payment by results was introduced into England by the Revised Code, issued May 9, 1862, and continued with modifications until 1897. Robert Lowe (*q.v.*) was responsible for its introduction. As originally introduced the grants were payable upon the results of individual examinations of pupils in Standards I to VI, in the three R's, and plain needlework for girls. Certain other conditions were also imposed, *e.g.* number of attendances, adequacy of buildings, qualifications of teachers, etc. The grants were paid to the managers of schools and not directly to the teachers. The curriculum thus depended on the distribution of grants, and subjects were added or removed according to their grant-earning capacity. At first everything beyond the three R's was discouraged. In 1867 grants were given for geography, grammar, and history as "specific subjects." In 1871 there were added as "specific subjects" algebra, geometry, natural philosophy, physical geography, natural science, political economy, and languages (English literature, and elements of Latin, French, and German). Vocal music was encouraged in a similar way a year or two later. In 1878 geography, history, grammar, and plain needlework became class subjects, and grants were given on class, not individual, examinations. The "specific subjects" in this year were mathematics (algebra, Euclid, and mensuration), Latin, French, German, mechanics, animal physiology, physical geography, botany, domestic economy (for girls). In 1882 the

Seventh Standard was recognized for purposes of the examination, and English literature and grammar, physical geography, and elementary science and history for the three highest standards became class subjects. Practical training for girls was also encouraged. In 1890 history was extended to all classes, drawing was made compulsory for boys, manual training and housewifery were counted as attendance subjects, shorthand became a "specific subject," and laundry work a "special." In 1891 navigation, in 1892 horticulture, in 1893 dairy making, in 1894 domestic economy and hygiene, became "specific subjects." In 1895 payment by results in elementary subjects was abolished for older schools, and in 1897 payment for "specific subjects" also disappeared.

Payment by results perhaps more than any other cause retarded the development of elementary education in England. Its only merits were that it established standards at a time when all teachers were not trained, artificially affected the curriculum, and was cheap. It was also a step in advance in so far as teachers were compelled to pay as much attention to lower classes as to higher, and to backward as well as to bright pupils. The latter, however, too often were reduced to the level of their inferiors. But while it introduced uniformity, there followed dull, mechanical methods and all other abuses connected with an exaggerated system of examinations. The recovery from the system is slow but certain; initiative and adaptation to local needs are being more and more encouraged; and mass education is being replaced by individual care and attention.

The system of payment by results is still employed by the Intermediate Board in making appropriations for secondary education in Ireland. The system is, however, being gradually modified by the introduction of inspection, and the imposition of certain conditions relative to the school buildings. (See IRELAND, EDUCATION IN.) In the Province of Victoria, Australia, the system was abolished as recently as 1906.

See APPORTIONMENT OF SCHOOL FUNDS; ENGLAND, EDUCATION IN; EXAMINATIONS; LOWE, ROBERT.

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PAYMENT OF TEACHERS. — See TEACHERS' SALARIES.

PAYNE, JOSEPH (1808–1876). — English educator, born at Bury St. Edmund's. His education was but scanty, and he only attended school for a short time when near the age of fourteen. Although compelled to earn a livelihood at an early age, he applied himself with great industry to the study of the classical and English literature. In 1828 he became assistant in a London school and about this time came across Jacotot's (*q.v.*) work. His pamphlet, *A Compendium Exposition of Professor Jacotot's celebrated System of Education* (1830), brought him to the notice of Mrs. David Fletcher, who made him tutor to her children. By associating other children with them Payne was soon able to open the Denmark Hill Grammar School. In 1837 he married Miss Dyer, who herself kept and continued to keep a girls' school. In 1845 he moved to Leatherhead and opened the Mansion House School, one of the best private schools of the time. Retiring from this work in 1863, Payne devoted himself to the advancement of the cause of education. He supported the Women's Education Union and the Girls' Public Day School Company (*q.v.*), which sprang from it. He took a keen interest in the Froebelian theories and the kindergarten movement, and studied the work of Pestalozzi and of Jacotot. Of the last named he was the chief exponent in England. He was intimately associated with the College of Preceptors (*q.v.*), before which he frequently lectured on educational subjects. When in 1872 the College established a chair in the Science and Art of Education, then the first in England, Payne was appointed to it. In 1874 he made a tour for the purpose of investigating educational institutions in North Germany. Not only did Payne devote himself to the cause of education, he was a keen student of philology and wrote a paper on the *Norman Element in the Spoken and Written English of the Twelfth, Thirteenth, and Fourteenth Centuries* for the Philological Society, of whose council he was chairman in 1873–1874. (See EDUCATION, ACADEMIC STUDY OF.)

While he made no original contributions to educational thought, Payne was a pioneer in introducing and familiarizing English educators with the best theory and practice of his day. If he exaggerated the value of Jacotot's methods, it was done largely in a spirit of reaction against the mechanical work of the schools. Through his connection with the College of Preceptors, which introduced the first examinations for teachers in England at the suggestion of Payne and C. H. Lake, he was able to inspire a number of teachers with his own enthusiasm for educational study and progress. His chief educational writings have been edited first by R. H. Quick in one volume, and reëdited, with the addition of a second volume, by his son, Dr. J. F. Payne. Volume I (1883) contains *Lectures on the Science and Art of Education*, and Volume II (1892), *Lectures on the History of Education, with a Visit* *to German Schools.* The first volume includes a list of Payne's published works.

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PAYNE, WILLIAM HAROLD (1836-1907). — University professor of education; born at Farmington, N.Y., the 12th of May, 1836. He was educated in the common schools and at the New York Conference Seminary. He began his teaching career in the public schools of New York. He was principal of schools at Three Rivers, Mich. (1858–1864); superintendent of schools at Niles, Mich. (1864–1866); principal of a seminary at Ypsilanti, Mich. (1866–1869), and superintendent of schools at Adrian, Mich. (1869–1879). His work as a school superintendent was distinguished by his untiring efforts to supplement the pedagogic training of the teachers under his charge. In 1879 he was called to the newly organized chair of the science and art of teaching at the University of Michigan, one of the earliest permanent university professorships of education. From 1888 to 1901 he was president of the University of Nashville; but upon the death of Professor B. A. Hinsdale he returned to his old post in the University of Michigan. His writings include *Chapters on School Supervision, Outlines of Educational Doctrine,* and *Contributions to the Science of Education.* Professor Payne was much interested in French educational thought, and he made excellent translations of some of the writings of Gabriel Compayré, including *The History of Pedagogy, Lectures on Pedagogy, Elements of Psychology,* and *Applied Psychology.* He also translated and edited Rousseau's *Émile.* For four years he was editor of the *Michigan Schoolmaster* (1866-1870). W. S. M.

See Education, Academic Study of.

PEABODY, ANDREW PRESTON (1811-1893). — College professor; graduated at Harvard in 1826, after which he studied theology at the Cambridge Divinity School. He taught school for three years; was three years tutor at Harvard, and for twenty-seven years was engaged in the ministry. He was professor of Christian morals at Harvard from 1860 to 1881, and acting president of the college in 1862 and again in 1868–1869. His publications include *Sermons for Children* (1866), *Manual of Moral Philosophy* (1874), and *Harvard Reminiscences* (1888). He also published a Sunday School hymn book. W. S. M.

PEABODY EDUCATION FUND. — One of the great educational foundations which have contributed to the remaking of Southern education. In 1867 George Peabody (*q.v.*) gave $3,000,000 in trust for the promotion of education in the South. Through various causes this sum shrank for a time to $2,000,000. Peabody is said to have relied largely on the advice of Robert C. Winthrop in the disposal of the fund and in the arrangements for carrying out its purposes. The conditions of the trust were so liberal and elastic that the trustees have been able to employ the fund in such a way as to educate the people of the South to certain needs, which when realized they must themselves satisfy. Thus the fund has established standards along different lines. The money has been used for the following purposes: (1) Aiding and establishing public schools in the large towns and cities, and thus practically beginning and supporting systems of public education until taken over by the local authorities. (2) Similarly assisting the rise of state systems, a task almost completed by 1875. (3) Encouraging the professional training of teachers by the establishment of a normal school at Nashville (Peabody Normal College, 1875) and granting scholarships to students of ability. This led to the general establishment of normal schools and by 1903 the trustees were again free to dispose of their fund in another direction. (4) Establishing an institution for the higher professional education of teachers. This decision was prompted by a movement begun in 1902 by President Porter of the Normal College, the faculty and alumni, and the citizens of Nashville. The Peabody Board recognized the value of the plan in 1903 and decided upon its adoption. The result is the George Peabody College for Teachers, which has received an endowment of $1,000,000 from the fund, land and buildings, valued at not over $250,000, from the University of Nashville, with which it was associated for thirty-six years, and grants from the State of Tennessee ($250,000), the county of Davidson ($100,000), and the city of Nashville ($200,000). The Trustees of the Fund have also offered to set aside $500,000 additional for the endowment of the College, provided a further sum of $1,000,000 is raised before Nov. 1, 1913. The College, to be opened in 1913, promises to be of the highest service to the educational Renaissance of the South. The new president is Dr. Bruce R. Payne. (5) Promoting rural consolidation of schools and the advancement of rural education by making grants towards the salaries of supervisors in many of the states of the South.

The Board of Trustees consists of sixteen members, who have always been men of the highest distinction in all walks of life. The most active associates in the early days were Hon. R. C. Winthrop, Hon. Hamilton Fish, Bishop MacIlvaine, Dr. Barnas Sears, the first agent, Dr. J. L. M. Curry, the second agent, Dr. Eben Stearns, first president of the Peabody Normal College, and Dr. W. H. Payne, his successor. At the present time Mr. J. Pierpont Morgan, Hon. Joseph H.

Choate, and Hon. Theodore Roosevelt are members of the Board of Trustees. Professor Wickliffe Rose is the general agent.

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PEABODY, ELIZABETH PALMER (1804–1894). — American apostle of Froebel and organizer of the first kindergartens (*q.v.*) in the United States; was born at Billerica, Mass. the 26th of May, 1804. Her mother, a gifted woman, conducted a private school, at which Elizabeth and her sisters Sophia (afterwards Mrs. Nathaniel Hawthorne) and Mary (afterwards Mrs. Horace Mann) were educated. At the age of eighteen years Miss Peabody began her career as a teacher in Boston. Later she was associated with A. Bronson Alcott (*q.v.*) in the famous Temple School. In connection with her teaching she contributed to many literary and educational journals, including the *Dial*, the *Christian Examiner*, the *Democratic Review*, and Barnard's *American Journal of Education.*

In 1859 she became acquainted with the educational ideas of Froebel, and the next year she opened a kindergarten in Boston — the first in America. In 1867 she went to Europe to study kindergarten principles and practices at first hand, and through her influence Emma Marwedel (*q.v.*) and several other experienced German kindergartners were induced to come to America. The normal classes which she conducted in Boston trained most of the early prominent American kindergartners (including Miss Lucy Wheelock). From 1873 to 1877 Miss Peabody edited the *Kindergarten Messenger*, and in 1877 the American Froebel Union, of which she was the first president, was formed.

Her publications include *Hebrew History, Grecian History, First Steps in History, Chronological History of the United States, Record of a School* (an account of Mr. Alcott's Temple School), *The Kindergarten, Education in the Home, the Kindergarten, and the Primary School, Guide to the Kindergarten and Moral Culture of Infancy* (with her sister Mrs. Horace Mann), *Lectures in the Training Schools for Kindergartners, Kindergartens in Italy*, and a translation of *De Gerando's Moral Self-Education.* She also contributed several papers to Henry Barnard's comprehensive volume *Kindergarten and Child Culture.* Miss Peabody was interested not only in the kindergarten, but in all phases of educational work, including the education of the American Indian. She died at Boston the 5th of January, 1894. W. S. M.

See KINDERGARTEN.

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PEABODY, GEORGE (1795–1869). — Benefactor of education and founder of the Peabody (Educational) Fund (*q.v.*); was educated in the common schools of Danvers (now Peabody), Mass. He engaged in business and made a fortune which he gave to various educational institutions and agencies. He founded the Peabody Institutes at Danvers, Salem, and Baltimore, and made large bequests to Harvard, Yale, and Kenyon Colleges. One of his largest bequests was to the Peabody Fund (*q.v.*) in 1867, "for the encouragement and promotion of intellectual, moral, and industrial education among the young of the more destitute portions of the Southern and Western states of the Union." One of his biographers says of him, "In the greatness of his benevolence George Peabody stands alone in history." W. S. M.

See PEABODY FUND.

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HANAFORD, PHEBE A. *Life of George Peabody.* (Boston, 1882.)

PEABODY, SELIM HOBART (1829–1903). — University president; was educated at the universities of Vermont and Iowa. He was principal of high schools at Burlington, Vt., Fond-du-lac, Wis., and Chicago; superintendent of schools at Racine, Wis.; professor in polytechnic colleges in Pennsylvania and Illinois, and president of the University of Illinois from 1880 to 1891. He was director of the educational exhibits at the World's Columbian Exposition at Chicago in 1893. His publications include *Astronomy* (1869), *Juvenile Natural History* (1869), *New Practical Arithmetic* (1872), and numerous articles in educational journals and the proceedings of educational associations. W. S. M.

PEACE, EDUCATIONAL ASPECTS OF INTERNATIONAL. — The peace movement is a part of the educational progress of the world. Whether in respect to its intellectual, economic, or moral phases, changes in opinion and practice have been effected by the educative process. Among the champions of the peace movement were Hugo Grotius, Jean Jacques Rousseau, and Immanuel Kant, and later, Noah Worcester, Elihu Burritt, Horace Mann, Professor Amasa Walker, and Edward Everett Hale, all of whom appreciated the necessity of educational propaganda.

The unification and direction of the intellectual life of the world through universities, colleges, and schools, has helped to prepare the way for international good will. The ease and rapidity of travel and communication by means of steam and electricity have helped to the same end. The ever advancing tide of civilization with its various humanitarian movement has tended to sweep away many of the barriers which kept nations apart from each other. The grouping of men in international societies working in the fields of science, industry, and social reform, has led to a unification of the higher life and has promoted friendship among the leaders of progress. The labor organizations of the world have been active in promoting peace propaganda, and in national and international assemblies have declared themselves as opposed to proscription and in favor of arbitration. The process of persuading the nations to abandon the archaic method of settling difficulties by force and to adopt the modern method of the court of justice is now carried on not merely by pacifists, but by the clergy, the press, law associations, women's clubs, and even by bodies engaged in promoting the economic welfare of the community. A concrete example of this is seen in the *Report* (1910) of the Massachusetts Commission on the Cost of Living, which after a careful investigation finds that the great increase of expenditures for armament is the cause of enormous waste, affecting the common welfare of the people.

Among the organizations engaged in developing and organizing world sentiment for peace are six hundred and more peace societies, the oldest of which is the American Peace Society, whose Secretary is Dr. Benjamin F. Trueblood; the Interparliamentary Union, composed of representatives from the parliaments and congresses of the world, holding biennial meetings; the International Peace Congress, the eighteenth session of which was held in Stockholm in 1910; the national peace congresses, of which three have been held in the United States, namely, in New York in 1907, said to be the largest peace assembly ever convened, in Chicago in 1909, and in Baltimore in 1911; the Bureau of International Peace at Berne, Switzerland, which undertakes to gather and distribute information and act as a clearing house for all propagandist work; the Mohonk Arbitration Conference, which has been held for the past seventeen years under the patronage and hospitality of Mr. Albert K. Smiley, and like all the other organizations mentioned has been highly educative in its plan of work and successful in interesting the leading merchants, bankers, lawyers, clergymen, and publicists in the moral, social, and economic importance of the peace movement. Of the organizations which are intended to influence students in schools, colleges, and universities, there is the World Peace Foundation, for the support of which Mr. Edwin Ginn has set aside $1,000,000, the income of which is to be applied in the publication of books and tracts on the history and progress of peace and in general propaganda work of an educative character. Closely affiliated with this Foundation is the American School Peace League, the object of which is to organize the teachers of the public schools in behalf of such teaching of history and other subjects and in such international exchange of teachers and correspondence as shall promote friendship among the youth of different lands. Through its influence the 18th of May, the anniversary of the calling of the first Hague Conference, is now celebrated largely throughout the United States as Peace Day. The Intercollegiate Peace Association has already organized oratorical contests in the colleges of several states. The Cosmopolitan Clubs, now forming a national association, afford meeting grounds in universities for men of different nations. Of the Harvard Cosmopolitan Club President Eliot has declared that it is the most interesting in the university. The Corda Fratres, an international federation of students which has more than 15,000 members in European universities and has recently added 40,000 French secondary students, has as its principal object the promotion of the idea of solidarity and fraternity among students. The World Student Christian Federation, which includes five intercollegiate associations of America, Great Britain, Germany, and Scandinavia, with a membership of 138,000 students and professors, is increasingly influential as a factor for peace. The annual interchange of professorships initiated by the universities of Berlin, Harvard, and Columbia, and now extending to many other institutions, as well as the interchange of students, will tend to produce common interests in the field of scholarship and sound learning. The American Conciliation Society, under the chairmanship of Dr. Nicholas Murray Butler, publishes each month the best information available, using a mailing list of 70,000 names. The recent gift of eleven and a half million dollars from Mr. Andrew Carnegie is a crowning event in a remarkable series. The trustees of this endowment have already shown their purpose to make it serve educational ends by announcing that work is to be undertaken in three departments, namely, (1) international law, (2) economic aspects of peace, and (3) education and intercourse. The men already appointed to be at the head of the first two departments are distinguished as educators, and without doubt the remaining appointee will be of the same class. S. T. D.

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See also the many publications of the American Association for International Conciliation (New York) and the World Peace Foundation, (Boston). Also *Reports* of the various peace societies and congresses mentioned in the text.

PEACHAM, HENRY (? 1576–1643). — English author, born at Northmimms, Hertfordshire, the son of a country rector. He was educated at schools near St. Alban's and in London, and proceeding to Trinity College, Cambridge, graduated B.A. in 1594–1595 and M.A. in 1598. After teaching for a time at Wymondham in Norfolk he took up the literary profession, for which he was well enough equipped by a knowledge, in addition to letters, of botany, music, heraldry, mathematics, drawing, and painting. His first work was the *Graphice or the most auncient and excellent Art of Drawing with the Pen and Limning in Water Colours* (London, 1606) which passed through many editions as *The Gentleman's Exercise.* In 1613–1614 Peacham made excellent use of an opportunity to travel in France, Italy, and Holland as tutor to the sons of Thomas Howard, Earl of Arundel. It was during a stay at the country home of M. Ligny, a French scholar and soldier, that Peacham was struck by the limitations in the training of English gentlemen and was inspired to write the work by which he is best known, the *Compleat Gentleman* (1622). This work was addressed to William Howard, the eight-year-old son of Earl Arundel. The *Compleat Gentleman* is in the main a plea for the better education of the upper classes. The rest of the work is a series of chapters on the different studies, each of which gives an epitome of their content. Under the title, " Of Stile in speaking and writing, and of History," Peacham gives a list of authors to be read in Latin and Greek. The chapter on Poetry is of considerable interest, for Shakespeare, Ben Jonson, and others are omitted from the number of Elizabethan poets. One of the newer studies which was being introduced into England at this time is " Antiquities," including statues, inscriptions, and coins. In the chapter on " Drawing, Limning, and Painting " Peacham gives directions on color mixing and an account of the lives of eminent painters. Of special value in the education of a gentleman is the study of blazons, armory, arms, and the dignity of heralds. Under " exercise of the body " Peacham includes horsemanship, running, leaping, swimming, and shooting. Under the title of " Reputation and Carriage " are given the special qualities desirable in a gentleman: — temperance, moderation, frugality, thrift, and affable discourse to be cultivated with the help of anagrams, epigrams, and impressas. Of the function of travel in the education of a gentleman Peacham says, " In my opinion nothing rectifieth and confirmeth more the judgment of a gentleman in forraine affaires, teacheth him knowledge of himselfe, and setleth his affection more sure to his owne Country, than travaile doth." In deciding whether travel should be for pleasure or profit, Peacham pronounces emphatically for the latter, and he strongly recommends a sojourn in France for giving point to the accomplishments of the gentleman. The education of the gentleman is completed by a study of " Military observation," which deals with the different military ranks and gives a list of military commands. In a " much inlarged " edition, published in 1627, a chapter is added on fishing, " the honest and patient man's Recreation, or a Pastime for all men to Recreate themselves at vacant houres." Here an account is given of the Angle rod, lines, flats, baits, flies, and different kinds of fish. While the *Compleat Gentleman* nowhere gives a detailed description of the gentleman, it is a valuable contribution to our knowledge of what in theory at any rate was considered of value in his make-up. (See also GENTRY AND NOBLES, EDUCATION OF; MANNERS AND MORALS, EDUCATION IN.)

Peacham was unfortunately reduced to poverty in his old age and turned his pen to writing political and social pamphlets, of which the most interesting are: *The Art of Living in London, or a Caution how Gentlemen, Countrymen and Strangers, drawn by occasion of Businesse, should dispose of themselves in the Thriftiest Way, not onely in the City, but in all other Populous Places* (1742), and *The Worth of a Penny, or a Caution to keep Money, with the Causes of the Scarcity and Misery of the Want thereof in these Hard and Merciless Times* (1641), a discussion of the economic condition of the country. Peacham is also said during this period to have written children's books at a penny each.

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PEARSON, ELIPHALET (1752–1828). — First preceptor of Phillips Academy at Andover; graduated at Harvard College in 1773 and taught for five years at Andover. He was principal of the Phillips Academy at Andover from 1778 to 1786 and professor in Harvard College from 1786 to 1826, and acting president from 1804 to 1806. He was one of the founders of the American Education Society (*q.v.*) and was active in the American Academy of Science and Arts. He was the author of a Hebrew grammar and several papers on religious education. W. S. M.

PÉCAUT, FÉLIX (1828–1898). — French clergyman, author, and educator. He completed his studies at the Faculty of Protestant Theology at Montauban, and received an appointment in his native city when only twenty-one years of age. Less than two years later he gave up his clerical calling on account of his heterodox views. These are set forth in his *Le Christ et la conscience* (1859). In the meantime he had moved to Paris, where he established a private school in conjunction with his friend Gaufrès. His ideas on national education evolved during the years immediately following the disaster of 1870 appeared in a series of letters to the *Temps*, *Lettres de province*, and in *Études au jour le jour sur l'éducation nationale* (1871–1879). Jules Ferry (*q.v.*), then minister of public instruction, and M. Buisson, director of primary education, were responsible for appointing Pécaut to the staff of general inspectors. With the great increase in the number of departmental normal schools, it became more than ever necessary to provide for the recruitment of the teaching force for these training schools. Pécaut was selected to direct the girls' higher primary normal school at Fontenay-aux-Roses. He devoted himself heart and soul to the undertaking, and spent nearly all his remaining days in this, the most important work of his life, retiring in 1896. The school still reflects much of his spirit and devotion. See his *Deux mois de mission en Italie* (1880); *L'esprit de Fontenay* (1895); *Adieux à l'école* (1896); *L'éducation et la vie nationale* (1897); *Quinze ans d'éducation*, a posthumous publication of writings collected by his sons. F. E. F.

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PECK, WILLIAM GUY (1820–1892) — Author of mathematical textbooks; graduated from the United States Military Academy at West Point in 1844. He was professor at West Point (1846–1855), at the University of Michigan (1855–1857), and at Columbia University. His publications include *Elementary Mechanics* (1859), *Natural Philosophy* (1860), *Popular Astronomy* (1882), and many school and college textbooks on mathematics. He was joint author with his father-in-law, Charles Davies, (*q.v.*) of the *Dictionary and Cyclopædia of Mathematical Science*. (1855). W. S. M.

PEDAGOGICAL JOURNALS. — See Journalism, Educational.

PEDAGOGICAL LITERATURE. — See Bibliography of Education; Journals, Educational; and the reference list at the close of each topic in this work.

PEDAGOGICAL SEMINARY. — See Journalism, Educational.

PEDAGOGY. — Pedagogy is commonly understood to mean the science and art of teaching. The word is derived from the Greeks, among whom a pedagogue was the person, usually, if not always, a slave, who attended the young boy, going with him to and from school, carrying his materials for study, looking out for his wants and exercising authority over him. It is supposed that the pedagogues were often such slaves as would be useless for other tasks, and that they were not held in much respect even by the children who were placed in their charge. The name thus acquired in ancient times a connotation of lack of esteem, if not of contempt, which it has not entirely shaken off in modern usage.

A somewhat similar meaning became attached to the derived term, "pedagogy." Since the Renaissance educational reformers have drawn more and more attention to the significance of the process of education as contrasted with that of the subject matter taught. The study of this process has been for several centuries referred to as pedagogy. The philosopher Kant (*q.v.*) denominated his lectures on education as *Über Pädagogik.* They dealt especially with the formation of habit, and moral training and instruction. Thus defined, pedagogy concerned that aspect of education commonly held to be most childish and least interesting, a phase of life relegated to nurses, mothers, and pedagogues, and felt to have little in it to command the thoughtful attention of the strong in mind or will. In fact, the management and instruction of children was from the fathers' or schoolmasters' point of view thought to resolve itself into an authoritative display of superior power. Learning was treated as a matter of application on the part of the pupil. Application was regarded as a question of will, and will as to be governed by commands. But to command children was held, on account of their weakness and lack of resources, not to require great strength or to merit much thought or esteem.

But while, on account of its derivation from the word pedagogue and its application to an art held in little honor, the term pedagogy at first failed to carry the implication of a profound science, nevertheless the existence of the ideal of such a study and its resolute pursuit by a few reformers eventually gained for it a richer content and a higher standing. In the beginning its practical influence was felt especially in the elementary schools. The nineteenth century brought with it in the more advanced nations of the world an extraordinary expansion of the facilities for elementary education. The preparation of teachers for this work came to be in the hands of normal and training schools. These institutions devoted themselves largely to the pedagogy of the subjects taught in the common schools and to the problems of school management.

It came to be an accepted principle that elementary teachers should know not only the subjects they were to teach, but also the art of their craft.

Eventually the idea that the scientific study of education should not be confined to the problems of the elementary school led to the establishment of departments of pedagogy in colleges and universities. The University of the City of New York (now New York University) offered such courses in 1832. The same institution established a School of Pedagogy in 1890 and offered the degree of Master and Doctor of Pedagogy. The New York State Normal College at Albany gives the degree of Bachelor of Pedagogy. Many universities, especially in the western part of the United States created professorships in pedagogy in the last two decades of the nineteenth century. See EDUCATION, ACADEMIC STUDY OF.

The introduction of the study into higher education led to new difficulties in regard to the term pedagogy. It was felt to be essentially a normal school subject, concerned especially with the problems of the elementary school and "rule-of-thumb" methods of teaching the subjects of its curriculum. The specialists of the universities were prone to regard the power to teach as due primarily to knowledge of subject matter. In addition to this they admitted the importance of natural aptitude and of experience, but rejected the efficacy of methods. Many ridiculed outright the pretensions of "pedagogy," and resented its injection into the curriculum of higher education. Some even went so far as to criticize the entire influence of pedagogy on elementary education, on the ground that in its emphasis on interest it had demoralized the work of the school, giving us "soft" pedagogy.

Much of this criticism of pedagogy as a university subject had, doubtless, validity, and in consequence it was necessary to modify and expand its content in order to secure for it a permanent foothold and equality of rank. To mark the change there grew up a tendency to substitute the word *education* for *pedagogy* as a title for the department and for professorships. Thus the term "pedagogy" has to a considerable extent passed out of vogue. The newer "education" differs from the older "pedagogy" in two respects. First, it includes far more than method in teaching and school management; second, it is more scientific. Taking up the first point, we note that all the educational functions and agencies of society are considered; the history and administration of education are taken into account; the care of the body is brought before the attention as well as the care of the mind, and the education of defectives as well as of the normal child; the educational ideals and the curriculum are treated both in general and in detail and the relation of education to general welfare is investigated. A good illustration of the expansion of the field is seen in the transition from the history of pedagogy such as we find in Compayré's volume with that title, to present-day history of education. Then the subject confined itself for the most part to the ideals and methods that have prevailed in the schools, together with some account of the conceptions and work of educational reformers. Now the historian of education tries to relate the processes and agencies of education to the institutional, economic, social, and cultural movements of history.

The second change that has come about with the transition from pedagogy to education lies in the more thoroughgoing and scientific methods employed to-day. On the one hand, a far wider range of underlying sciences is brought into requisition in the treatment of educational problems. Thus not only psychology and philosophy, but also biology, physiology, sociology, and economics are brought to bear on the work. On the other hand, the propagation of opinions, "armchair" pedagogy, has been replaced by resolute search for facts through historical research, through comparative study, through the use of experiment and statistical methods. The department of education brings to scientific research a set of interesting practical problems and to the schoolmaster a mass of incontrovertible facts and conclusions that cannot fail to prove of practical use.

It is interesting to note that the term pedagogy bids fair to be revived in the title "experimental pedagogy." This science springs not so much from the desire of the schoolmaster or the educational reformer to establish teaching on an unshakable basis, as from the tendency on the part of experimental psychology to reach out into new fields, especially those where its methods and principles can be made to bear on the practical world. But, although somewhat different in its origin from genetic and educational psychology, which began as attempts to get a scientific basis for teaching rather than new problems for science, experimental pedagogy naturally tends to include both these forerunners. E. N. H.

See EDUCATION, ACADEMIC STUDY OF; EXPERIMENTAL EDUCATION; PSYCHOLOGY, EDUCATIONAL; PHILOSOPHY OF EDUCATION; also CHILD STUDY.

PEDAGOGY, DOCTOR OF. — See DEGREES.

PEDANTRY. — A term given to the display of knowledge for the sake of its display, especially in the exhibition of knowledge upon unusual topics and subjects irrelevant to current needs and interests and hence lacking application. Probably one indispensable factor in pedantry is that the knowledge exhibited be second hand, or show dependence upon somewhat antiquated authorities, being more or less accompanied by quotations from them. Knowledge that seems vital and important at one epoch may seem a useless affectation at another. At the Renaissance, reformers like Montaigne (*q.v.*) and humorists like Rabelais (*q.v.*) found most scholastic scholarship to be mere pedantry while the successors of the humanists regarded as pedantry the humanists display of classical allusions and Ciceronian Latinity. Such historic illustrations show that the question underlying pedantry is the readaptation of the learning of the past to contemporary conditions. J. D.

See KNOWLEDGE; MONTAIGNE; RENAISSANCE AND EDUCATION.

PEDICULOSIS.— See INFECTIOUS DISEASES.

PEDOLOGY. — See PARENTHOOD, EDUCATION FOR.

PEET, HARVEY PRINDLE (1794-1873). — Educator of the deaf; graduated from Yale College in 1822, having previously taught in the district schools of Connecticut. He was an instructor in the American Asylum for the Deaf at Hartford from 1822 to 1831, when he was called to the principalship of the New York Institution for the Deaf. He prepared a series of textbooks for the use of deaf children and published many papers on the education of the deaf, which were collected and published with the title *Summary of the Recorded Researches and Opinions of H. P. Peet* (Washington, 1873). W. S. M.

See DEAF, EDUCATION OF THE.

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See also the *American Annals of the Deaf and Dumb* for 1873.

PEIRCE, BENJAMIN (1809-1880). — Mathematician and textbook author; graduated from Harvard University in 1829. He was for two years associated with George Bancroft (*q.v.*) as a teacher in the famous Round Hill School (*q.v.*) at Northampton, Mass. From 1831 to his death he was tutor and professor at Harvard. His publications include: *Plane and Spherical Trigonometry* (1835), *Algebra* (1837), *Plane and Solid Geometry* (1837), *Miscellany of Mathematics and Physics* (1842), *Analytic Mechanics* (1855), and many papers on mathematical science. He was also the author of the *History of Harvard University from its Foundation in the Year 1636 to the Period of the American Revolution* (1833). W. S. M.

PEIRCE, CYRUS (1790-1859). — Principal of the first state normal school organized in the United States; graduated from Harvard College in 1810. He taught for two years and then studied for the ministry. He was in the service of the church for eight years; " he abandoned the pulpit for the desk of the teacher." He taught four years at Andover and nine years at Nantucket. On the organization of the first state normal school at Lexington (now at Framingham), Mass., in 1839, he was chosen by Horace Mann as principal. " Only three students presented themselves at the opening of the school," but the earnestness and skill of Mr. Peirce " soon attracted attention; and the apathy with which his labors were regarded by many friends of education gradually gave place to confidence." The normal school was removed to West Newton in 1844 and to Framingham in 1849. W. S. M.

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PENALTIES AND REWARDS. — See REWARDS AND PUNISHMENTS; SCHOOL MANAGEMENT.

PENCRICHE, RICHARD. — See ANGLO-NORMAN SCHOOLS; BLACK DEATH.

PENIKESE SUMMER SCHOOL. — See SUMMER SCHOOLS.

PENMANSHIP. — See WRITING.

PENN CHARTER SCHOOL. — See FRIENDS, EDUCATIONAL INFLUENCE OF THE SOCIETY OF.

PENN, WILLIAM (1644-1718). — Founder of Pennsylvania; studied at Christ College, Oxford, but was fined and expelled for " the sin of nonconformity," having connected himself with the Society of Friends. He continued his education in France, and in 1681 obtained grants of land in America which he organized into the colony of Pennsylvania. Before leaving England, he stipulated that the governor and provincial council of the new colony " shall erect and order all public schools and reward the authors of useful sciences and laudable inventions." In the charter granted by Penn in 1711 he emphasized the importance of a " good education of youth, and their early introduction in the principles of true religion and virtue, and qualifying them to serve their country and themselves by breeding them in reading, writing, and learning of languages and useful arts and sciences, suitable to their sex and age and degree." His important educational writing is *Charter of ye Publik School founded in ye Town and County of Philadelphia in Pennsylvania* (Philadelphia, 1701). W. S. M.

See FRIENDS, EDUCATIONAL WORK OF SOCIETY OF; PENNSYLVANIA, STATE OF.

PENNSYLVANIA COLLEGE FOR WOMEN, PITTSBURGH, PA. — Founded in December, 1869, by persons interested in promoting the higher education of women in this region. In addition to the academic department leading to all regular college degrees, there is a music department offering courses in connection with regular college work and a special music course leading to a certificate. A department of social service has been organized recently giving special training to social workers who wish to enter paid work or to give intelligent services as volunteers, and the course combines theoretical study and practical work. Pittsburg, with its great industries and its diversified philanthropies, is an unusual field for observation, investigation, and practical work; many of the institutions coöperate with the college, and experienced social workers give individual assistance. The entrance requirements to the college courses which lead to the degree of A.B. are four years' work of a high school. The social life receives much attention from the point of view of individual training. The faculty consists of eighteen members and the enrollment of students, excluding those in the department of music, was 134 in 1910–1911. C. H. C.

PENNSYLVANIA COLLEGE, GETTYSBURG, PA. — A nonsectarian institution, founded and fostered by the General Synod Lutheran Church, chartered by the legislature of Pennsylvania in 1832. The impulse which led to the founding of the college came from the Lutheran Theological Seminary established in Gettysburg six years earlier. Thus, while the primary motive was to furnish a thorough preparation for the men contemplating the seminary course in theology, the general object of the founders was the promotion of academic and scientific education under Christian influences. The course of study, as originally planned, covered the subjects of philosophy, Latin, Greek, natural science, mathematics, English, and German, leading to the degree of A.B. From 1840 to 1861 a medical department, located at Philadelphia, was connected with the college. In 1884 the scientific department was organized, leading to a division of the course into classical and scientific. During recent years a number of new courses have been added, offering a wider range of choice and differentiation of courses of study. There are at present (1912) nine group courses, determined by the major course of study, leading to the Bachelor's degree. The fourteen units recommended by the committee of uniform college entrance requirements are required for admission to the freshman class. The school is controlled by a self-perpetuating board of trustees consisting of thirty-six members. The grounds and equipment are valued (1912) at $660,000 including a library of 25,000 volumes. The productive endowment amounts to $225,600. The total income for the year ending July 1, 1911, was $41,877.46. The enrollment in 1910–1911 was 323. Women have been admitted since 1886. The teaching force numbers 23. C. F. S.

PENNSYLVANIA MILITARY COLLEGE, CHESTER, PA. — An institution organized in 1862 as the Pennsylvania Military Academy, and located at Chester in 1865. The college was the outgrowth of a private boarding school established at Wilmington, Del., in 1821. Military instruction was introduced in 1858. In 1892 the academy adopted the present title. Preparatory and collegiate (civil engineering, chemical, and academic) departments are maintained. Definite entrance requirements are not stated. Degrees are conferred. The enrollment of collegiate students in 1911–1912 was 104; and the faculty consisted of fifteen members.

PENNSYLVANIA, STATE COLLEGE OF, STATE COLLEGE, PA. — Was established by the "Morrill Act" passed by Congress July 2, 1862, and a reciprocal act of the legislature of Pennsylvania passed April 1, 1863. As early as 1855 a charter had been issued to certain public-spirited citizens under the patronage of the state Board of Agriculture, and in 1859 an institution for secondary agricultural education was opened at the present location under the name of "The Farmers' High School," the first class being graduated in 1861. Under the new establishment, the name was changed in 1874 to The Pennsylvania State College. Some of the trustees are *ex officio* state officials; others are appointed by the Governor; others are chosen by the alumni of the college; and still others are elected by delegates from industrial organizations of the state.

The growth was small until 1887, when the state began a regular biennial appropriation to the institution, the total of which now (1911) aggregates $3,565,726.43. The most recent appropriation was $800,000. The growth in total attendance of students by decades is as follows: 1891, 209; 1901, 433; 1911, 2007. The present force of instructors numbers 190. No tuition is charged, but preference in admission is given to residents of the state. A very small percentage of the students come from other states and foreign countries. Fourteen units are required for entrance to the college.

There are five schools, viz. agriculture, engineering, liberal arts, mining, and natural science; also one department, home economics. In these schools thirty-six courses of study are offered leading to the Bachelor's degree. Courses are also offered leading to the Master's degree. Correspondence work is confined to lessons on agricultural topics, in which

3600 students are now enrolled, and to students in the Summer Session who wish to continue their instruction.

Six hundred acres of farm land are owned by the college, part of which is devoted to experimental farming, part to forestry wood lots, and part to campus. The total value of land and buildings is $1,444,369.

The college differs from other institutions mainly in its rural environment which develops a solidarity of college sentiment, a harmony of college life, an effective system of student self-government, an economy in style of living, and a devotion to the more serious aspects of college residence. Attendance on chapel service is compulsory, many Bible classes are maintained, and the Christian Association has an active membership numbering 1200. There are ten chapters of national fraternities, most of whom own chapter houses in which their members reside. Edwin Erle Sparks, Ph.D., LL.D., is the president of the college.

E. E. S.

PENNSYLVANIA, STATE OF. — One of the largest and most important of the thirteen original states. First settled along the Delaware by the Swedes in 1638, it was taken over by the Dutch in 1665, and by the English in 1674; later, granted to William Penn as a proprietary colony by Charles II in 1681 and settled by him in 1682. Pennsylvania continued under Penn's charters of 1682 and 1701 up to the Revolution, and was the second state to ratify the Federal Constitution, in 1787. It has a land area of 44,832 square miles or about the size of England proper. For administrative purposes the state is divided into the city of Philadelphia and sixty-six counties, and the counties are in turn divided into city, town, borough, and township school districts. In 1910 Pennsylvania had a total population of 7,665,111, one fifth of which was in the city of Philadelphia, the density of population was 171 persons per square mile.

Educational History. — Penn's first charter, drawn up in England in 1682, provided that "the Governor and provincial council shall erect and order all public schools, and encourage and reward the authors of useful sciences and laudable inventions in the said province " and provided for " a committee of manners, education, and arts " to prevent " all wicked and scandalous living " and to see that the youth were " trained up in virtue and useful knowledge and arts." It was further agreed upon, in England, as a law for the colony, " 28: That all children within this province of the age of twelve years shall be taught some useful trade or skill, to the end that none may be idle." The first general assembly of the colony, sitting at Chester in December, 1682, adopted these provisions. The second provincial assembly, sitting in Philadelphia in 1683, provided further " that all persons in this province and territories thereof having children, and all guardians and trustees of orphans, shall cause such to be instructed in reading and writing, so that they may be able to read the Scriptures and to write by the time they attain to twelve years of age, and that they be taught some useful trade or skill," and imposed a fine of £5 per child for failure to comply, unless the child was incapacitated for learning " in body or understanding." This law was so much in advance of ideas then current in England that it was disapproved by William and Mary, but was enacted by the Governor and the assembly in 1693. The law appears to have been enforced in a few places for a time, but soon became a dead letter and was omitted entirely from the revision of 1696.

In 1683 Enoch Flower was engaged as schoolmaster at Philadelphia, and this was the first regular school established in the state. In 1689 a " Friends' Public School " was opened in Philadelphia, after the type of a public grammar school of the time in England. This was chartered in 1697, and again in 1701, 1708, and 1711, and evolved into the William Penn Charter School. This school has been continuously in existence since 1689, and ranks as one of the oldest schools in America. Another school was established at Darby in 1692, and in 1697 the Society of Friends established a second school in Philadelphia, which took poor scholars free, and was the first public free school established within the state. But few other schools seem to have been established, and but little colonial legislation of any kind occurred after 1700. " The first three quarters of the eighteenth century," says Wickersham, "are almost a perfect blank as far as anything was done by the public authorities to provide an education for the people."

Before the Revolution many parochial schools were established by the different denominations, with the clergy frequently as the teachers; private pay schools were established in the towns and cities, and the beginnings of free education for the poor were made. Some of the private schools thus established, such as the Germantown Academy (1761) and the Moravian schools at Bethlehem and Nazareth, founded still earlier, attained a wide reputation and drew pupils from other colonies. The educational policy which developed early was that of depending upon parochial and private efforts, of making no attempt to provide any form of education for those who could pay for it themselves, and of extending charitable education to but a limited number and for a limited time.

A marked exception to these conditions was found among the settlers from Connecticut, and other parts of New England, who settled in the Wyoming Valley, in northeastern Pennsylvania. These people brought with them from New England their political independence and their zeal for education. The result was that they were politically troublesome and educationally efficient. In 1768 it was decreed that each township within the settlement should reserve 960 acres of land "for the public use of a gospel ministry and the schools." This was done, and, though there were some losses, the schools derived benefit from the greater part of the reservation, and some schools to-day still receive income from these old grants. School committees were elected by the inhabitants, for each school district, and these in turn employed the teacher, supervised the school, and collected a rate-bill form of tax to pay the teacher. There was also a township tax to provide schoolhouses, and in some cases also to pay teachers. The schools thus established continued in operation until the adoption of the first state school law in 1834, were the nearest approach to public schools of any established before that date in the state, and exercised considerable influence in shaping the new Pennsylvania law.

In 1776 the first constitution made liberal educational provision. Schools were ordered to be established in each county, "with such salaries to the masters, paid by the public, as may enable them to instruct youth at low prices; and all useful learning shall be duly encouraged and promoted in one or more universities." Practically nothing was done under the provisions of this constitution.

Pennsylvania ratified the Federal Constitution in 1787, and in the first constitution adopted after that, in 1790, the early liberal provision was withdrawn, and a provision for the establishment of charity schools was inserted in its stead. The legislature was directed, "as soon as conveniently may be," to provide by law "for the establishment of schools throughout the state, in such manner that the poor may be taught *gratis*." The "rights, privileges, immunities, and estates of religious societies and corporate bodies" were guaranteed, as before, and the promotion of "the arts and sciences" was directed, "in one or more seminaries of learning." These provisions were continued unaltered in the new constitution of 1838.

An act of 1802 made the first provision for carrying these constitutional mandates into effect. This gave to the overseers and guardians of the poor the task of selecting the children who were to receive a charitable education, and of collecting the money, by an increase in the "poor rates," with which to provide their books and tuition. In 1809, in an effort to remove the pauper taint, the administration of the law was given to the township assessors and county commissioners, but without success in eliminating the name of "pauper schools." In 1824 an effort was made to substitute a form of a public for a pauper school system, by a law which provided for an election in each township, borough, or ward, which should accept the law, of a board of three school men, one to be elected each year. This law was too advanced to stand, and two years later it was repealed and the old pauper school law of 1809 was substituted for it. In this condition matters remained until 1834. During the first forty years of statehood, the chief educational legislation was in the form of private incorporation acts for schools and colleges, a number of which were granted some state aid. By 1830 as many as 133 such special acts had been passed, and in 1833 there were two universities, eight colleges, and fifty academies which had been aided, to some degree, and mostly in return for the education of poor children, by grants from the state.

A few movements looking toward a state public school system were made early in the century. In 1812 the City Council of Philadelphia and the County Commissioners, acting jointly, were permitted to take such action as the public good might require toward the establishment of schools; in 1814 "The Society for the Promotion of a Rational System of Education" was organized in Philadelphia; in 1818 the City of Philadelphia was organized by special law, as the first school district of Pennsylvania, and permission was given to provide Lancasterian schools for the education of the poor (see PHILADELPHIA, CITY OF; also LANCASTER, JOSEPH); in 1821 the counties of Dauphin (Harrisburg), Allegheny (Pittsburg), Cumberland (Carlisle), and Lancaster (Lancaster) were also exempted from the operation of the pauper school law; in 1822 the city of Lancaster was organized by special law, as the second school district of Pennsylvania; and Governors of the state, in their messages to the legislature from 1801 on, made repeated recommendations that some further action be taken to carry into effect the constitutional mandates and to provide better educational advantages for the children of the state. In 1822 the Committee on Education of the Senate reported that the Act of 1809 was wholly inoperative in many counties, and much abused in others, and a report made to the House of Representatives in 1829 showed that there had been educated free, in the 31 counties reporting, but 4940 poor children in 1825; 7943 in 1826; 9014 in 1827; and 4477 in 1828. In 1833, the last year of the pauper school system, the number of free pupils educated was 17,467, and the total cost but $48,466.25.

The bill establishing the State Common School Fund, 1831, provided for the addition of the income from the sale of public lands, and the interest on the same, until a fund of $2,000,000 should be reached, after which the income should be applied annually to the maintenance of schools. It was estimated that this would be in about ten years, but, in 1834, the friends of education succeeded in passing a bill which made the beginnings of a state school system at that time. This act contained many of the provisions of the law of 1824, and the unsuccessful bills of 1831 and 1833. Each county was made a school division, and each ward, township, and borough a school district. For each school district a board of six school directors was to be elected by the people, one third of whom should go out of office each year. Each county court was to appoint two inspectors for each district, and the Secretary of State was made *ex officio* Superintendent of Public Schools. The income from the state school fund was to be supplemented by a state appropriation of $75,000 and by county and local taxation; though any district might decide to raise no tax for free schools, forfeit its state apportionment, and fall back on the provisions of the old 1806 law for the maintenance of pauper schools.

The provisions here made for free schools, and for secular schools at that, seemed almost revolutionary at the time, and the law was vigorously attacked in the next legislature. Petitions asking for the repeal of the law, signed by 32,000 voters, mostly signed in German script, were presented. The House leader was Thaddeus Stevens, to whom the credit for saving the law has been given. An act of 1836 revised and strengthened all preceding legislation, and laid down the main lines along which the school system of Pennsylvania later developed.

The new school system was accepted but slowly. During the first year of its operation, 536 out of 907 districts accepted the system, 762 schools were conducted, and an average term of 3½ months was provided. During the next two years, the *ex officio* State Superintendent did much to explain the new system and to secure its acceptance by the people, so that by 1838 the number of districts accepting the new system had increased to 861, out of a total of 1033. By 1847, the last year of the old system, 1105 of the 1249 districts had accepted the system. It was not until 1873, however, that the last district surrendered and accepted the state school system. In 1837 the United States Surplus Revenue (see NATIONAL GOVERNMENT AND EDUCATION) was received, and for two or three years very material aid was given to the new school system by appropriations from this fund, to be used for buildings and yearly maintenance. Probably about $800,000 was derived from this source before the fund was all spent; the aid was no doubt timely and helpful, as the people were not yet willing to bear taxation for schools.

In 1838 the state attempted to systematize the grants for universities, colleges, academies, and female seminaries, which had been made from time to time for nearly half a century, by a general law granting annual state aid to all such institutions meeting certain conditions. The grants were to run for ten years, but in 1843 they were cut in half, and in 1844 entirely abandoned. In 1840 school directors were authorized, directly or by the aid of competent persons, to examine and certificate all teachers. In 1843 directors of city, ward, or borough school districts were authorized to employ district superintendents, and in 1849 this provision was extended to all state-aided districts. Few superintendents were ever employed, and the law was superseded in 1854 by the law providing county supervision. The elections of 1848 being so favorable (about 90 per cent for), the legislature in that year extended the school system to include all school districts. It was twenty years, however, before public schools existed in all of the school districts of the state. In 1849 the laws were recodified, and the minimum term extended from three to four months. This created so much opposition, however, that in 1851 the law was in part repealed. In 1836 Philadelphia had been authorized to establish a high school; similar permission was granted to Pittsburg in 1849, and to Easton in 1850; and in 1854 all doubt as to the legality of districts establishing such schools was removed by a general law, authorizing the establishment of "graded schools and the study of the higher branches."

In 1850 a state convention of the friends of education was held in Harrisburg. The proceedings and resolutions of this convention, published by direction of the legislature, were made a platform for educational advancement, and did much to secure the new law of 1854. In January, 1852, the first number of the *Pennsylvania School Journal* was issued, and in 1855 was made the official organ of the State Educational Department. In 1852 the State Teachers' Association was organized at Harrisburg. Teachers' institutes were now organized in a number of counties, and other conventions held. The result of this awakening was the new school law of 1854, which reorganized the system. By this law the township was made the unit of the system, and districts were given corporate powers; the minimum school term was again increased to four months, and separate schools for negroes were required, where practicable; a district tax for school buildings and the publication of a book by the State Superintendent on school architecture were authorized; reading, writing, spelling, grammar, geography, and arithmetic were made statutory school subjects, thus doubling the course of instruction in many districts; school directors and teachers were directed to adopt textbooks for the district; grants for instruction to endowed and to religious schools were prohibited; and the offices of county superintendent of schools for each county and of deputy superintendent of common schools were created.. In 1857 the office of State Superintendent was detached from that of Secretary of State, a separate department of common schools was created, and a State Superintendent of Common Schools, to be appointed by the Governor for three-year terms, was provided for. The year 1857 also marked the first provision for the education of teachers made by the state. The state was divided into twelve normal-school districts (increased to thirteen in 1874), in each of which a normal school was eventually to be established. In 1859 the Lancaster County normal school, at Millersville (opened in 1855), was recognized as the first state normal school; in 1861 the school at Edinboro, in 1862 the school at Mansfield, and in 1866 the school at Kutztown, were similarly recognized. By 1877, ten schools had been recognized, and the thirteenth was added in 1893. These schools, private in nature, received state aid for buildings and for each pupil trained.

In 1863 an attempt was made to change the basis of apportioning state aid from taxables to school census, but the returns were so unreliable that the taxable basis was restored in 1864. In 1864 the first school library law was enacted. By 1866 the teachers' institutes, begun after 1850, had extended to twenty-three counties of the state, and in 1867 they were legalized and required for all counties with county aid. By the law of 1867, cities and boroughs having a population of 10,000 were permitted to employ city superintendents; the right of eminent domain was granted to districts; the old "provisional certificate," based on an examination in reading, writing, and arithmetic only, was abolished, and all teachers were required to pass an examination in reading, writing, spelling, arithmetic, geography, grammar, United States history, and the theory of teaching; county superintendents were required to hold a teacher's certificate, or to be a graduate of a college or a normal school; and the state permanent teachers' certificates were also authorized. In 1864 the Pennsylvania Soldiers' Orphan Schools were organized, and in 1871 the Pennsylvania Training School for the Feeble-minded was established at Media. In 1872 the minimum school term was increased to five months.

In 1873 a new state constitution was adopted, and in this the progress made during the preceding forty years was recorded and somewhat extended. After the adoption of the new constitution, no new code of laws was enacted, the schools continuing under the laws of 1854 and 1876, with various minor amendments, until the adoption of the new school code in 1911. In 1881 the requirement of separate schools for the races, instituted in 1854, was withdrawn, with but little resulting change. In 1883 an evening school law was enacted. In 1885 physiology and hygiene were added to the list of examination subjects for teachers' certificates, and in 1901 civil government and elementary algebra. In 1887 teachers were first paid for attending teachers' institutes, and separate city teachers' institutes were authorized. In 1893 a district free-textbook law was enacted, the county superintendents' salary law (first enacted in 1878) was revised, and state teachers' certificates were first granted to college graduates. In 1895 there was quite an amount of legislation with regard to district lines, district indebtedness, and district boards; boards of directors were permitted to establish free public libraries, and to levy a one-mill tax for their support; a vaccination law and an anti-religious-garb law were enacted; and joint high schools were authorized, state aid for high schools extended, and the State Superintendent instructed to prescribe a uniform high school course. In 1897 the distribution of state aid was finally changed from the old basis of taxables to a plan based on a combination of teachers, taxables, and school census; stenography and typewriting and kindergartens were authorized; the transportation of pupils was permitted; and a schoolhouse flag law was passed. In 1899 the minimum school term was extended from six to seven months, and a State Free Library Commission was established. In 1901 township centralization, with the transportation of pupils, night manual training schools, and township supervising principals were authorized. In 1907 a minimum salary law, with state aid to weak districts, a school sanitation law, and an annual school directors' convention law were enacted. In 1909 the child labor law was revised and materially strengthened, and a detailed law relating to the handling of school diseases was enacted.

In 1907 the legislature passed a law directing the Governor to appoint an educational commission, to revise and codify the school laws of Pennsylvania. A carefully revised code was prepared and submitted to the legislature of 1909, passed by the legislature, but vetoed by the Governor. The same commission submitted a similar code to the legislature of 1911, and this finally became a law.

Present School System. — At the head of the present school system of Pennsylvania, as reorganized in 1911, is a State Board of Education, and a State Superintendent of Public Instruction. The State Board of Education consists of six citizens, appointed by the Governor (the members of the educational commission were appointed as the first State Board) with the concurrence of two thirds of the Senate, and for six-year terms, one going out of office each year. The State Superintendent of Public Instruction, also appointed by the Governor, for four-year terms, is *ex officio* a member and president of the State Board. The members serve without pay, and one half of them must be experienced educators, connected with the public school system of the state. The Board has important duties, largely advisory, and important business functions, and it may elect such officers, employ such assistants, and incur such expense, as it deems necessary. All schools in the state, of whatever kind, supported in whole or in part from state sources, must report to the Board. It may make such bylaws and prescribe such rules and regulations for the sanitary inspection and equipment of schools as it may deem necessary. It is charged with the care and management of the state school fund and with the promotion of agricultural, vocational, and industrial education in the state. For this purpose, and also for the equalization of educational advantages throughout the state, the Board may use so much of the income of the state school fund as it sees fit. It is charged with the purchase of the thirteen normal schools of the state from the stockholders, and thereafter with the appointment of trustees for the schools purchased. The Board is directed to prepare and publish schoolhouse plans, and to furnish them free to districts, and all plans for the construction or reconstruction of buildings, except in first-class districts (Philadelphia and Pittsburg) must be approved by the State Board. The Board makes an annual report to the Governor as to its work and as to the condition of the state school fund, and the Board is also instructed to recommend needed legislation to the Governor and the legislature.

The State Superintendent acts as the executive officer of the Board and has more than the usual functions of this officer. He appoints all of his deputies and assistants, consisting of two deputy superintendents, three experts in agricultural education, industrial education, and drawing, four inspectors of elementary and high schools, and all necessary clerks, and at salaries fixed by law.

For each of the sixty-six counties a county superintendent is elected, for four-year terms, by a convention of all the school directors (trustees) in the county representing districts not employing a city or town superintendent. Assistant superintendents must possess the same qualifications as county superintendents, and are appointed for the same length of time. They assist the county superintendent in the supervision of instruction, the inspection of grounds and buildings, the approval of courses of study, the conferring with directors, and the examination of pupils and schools, and may act for him, as directed. They also examine teachers for the schools of their counties.

Each county is divided into a number of school districts, each city, incorporated town, borough, or township constituting a separate school district, coterminous with the civic division. All independent school districts were abolished in 1911, though provision for their temporary reconstitution was made. All districts are divided into four classes, as follows: 1st, population of over 500,000,— board of 15; 2d, population of 30,000 to 500,000,— board of 9; 3d, population of 5000 to 30,000, board of 7; 4th, population of less than 5000,— board of 5. There are but two first-class districts, Philadelphia and Pittsburg, and for a description of these and their powers, see special article on PHILADELPHIA, CITY OF. For the other classes of districts, the boards of school directors are elected at large, and for six-year terms, approximately one third going out of office each year. Each district is a school corporation, and the title of all school property is vested in the school district. First and second-class districts must, and third-class districts may, appoint a district (city) superintendent of schools for a four-year term, after which such districts are not under the supervision of the county superintendent of schools. The district superintendent must be commissioned by the State Superintendent, and succeeds to all the duties and powers of the county superintendent. Any third or fourth-class district may appoint a supervising principal. Each board of directors must provide a sufficient number of schools to educate all children six to twenty-one, and they also have the power to provide high schools, evening schools, kindergartens, vocational schools, libraries, museums, playgrounds, special class schools, truant and parental schools, schools for adults, and such other schools as they deem desirable. On petition of the parents of twenty-five children over fourteen, they must provide an evening school, and on petition of seventy-five taxpayers, they must provide an evening manual training school. Any board may establish an agricultural school, and admit those over twenty-one to any vocational classes. Each board also has the power to levy taxes, within fixed limits, for all school purposes; may, similarly, borrow money, and issue bonds; may acquire real estate; may make and enforce all reasonable rules and regulations; may appoint and, for proper cause, may remove teachers and all other employes; in first- and second-class districts must, and in third- and fourth-class districts may, control all student activities and publications; must furnish the textbooks and supplies needed, and may loan books to pupils during vacations; are to adopt courses of study, with the approval of the district or county superintendent; may provide transportation for pupils, or may consolidate schools, or may do both; must take and report an annual school census; and must maintain all schools in the English language. Textbooks are adopted by the boards for five-year periods, and no change can be made, without the recommendation of the superintendent, except by a two thirds vote.

School Support. — The schools are supported by a state appropriation and by local taxation, the latter comprising about 80 per cent of all income for maintenance. The state appropriation was about seven million dollars at last report, and this is distributed to the districts (since 1911) on the combined basis of one half on teachers actually employed and one half on school census. The state school fund, created in 1911, is to consist of 80 per cent of the net income from the state's forest reserves (estimated at 1,000,000 acres), the income from the state's water-power rights, the income and proceeds from all state lands not used for public purposes, all escheated estates, and all property or money given to the fund. The State Board of Education is to use so much of the income as they deem wise, to equalize educational advantages in the state, and to aid education in forestry, agriculture, and industrial pursuits, and then to add the remainder of the income to the principal of the fund. Under the new law, each district levies its own school taxes. In first-class districts, the levy must be between five and six mills, in second-class districts not over twenty mills, and in third- and fourth-class districts not over twenty-five mills.

Teachers and Training. — Three grades of teachers' certificates are issued, — provisional, professional, and state. Each must state on its face the subjects of the examination, for which alone it is valid. No teacher may teach any subject not named on the face of the certificate, so that this virtually creates a form of high school certificate. Each superintendent, county or district, may examine and certificate teachers for his own county or district. Provisional certificates are valid only in the district where issued, and for one year, and no teacher may teach on such over five years. Professional certificates presuppose two years' experience, more advanced examinations, are renewable three times, and may be granted inter-county recognition. State certificates are valid throughout the state, and presuppose two years of teaching on a professional certificate, or college or normal school graduation. Full recognition is granted to college and normal school graduates, and good inter-state recognition of certificates prevails. A certificate cannot be issued to a person addicted to the use of drink and narcotics, not physically and mentally sound, or not of good character, and any certificate issued may be annulled for cause. The reading of pedagogical books designated by the State Superintendent is emphasized in the granting of all higher certificates. Any district may create or contribute to a teachers' retirement fund. A minimum salary law for teachers insures a salary of $60 or $65 a month, according to the certificate held.

For the training of future teachers, the state subsidizes and exercises a partial control over thirteen so-called state normal schools. The new school code contemplates the purchase of each of these joint-stock institutions, authorizes the State Board of Education to negotiate purchases, and directs each legislature to appropriate $200,000 for the purpose, until all of the thirteen schools are acquired. Philadelphia, Pittsburg, and Reading maintain city normal schools.

Educational Conditions. — A good medical inspection law was incorporated in the new code, by which all first- and second-class districts must provide for medical inspection, third-class districts must also, unless they vote annually not to do so, and fourth-class districts are to be provided with medical inspection by the State Commissioner of Health, unless they notify him in writing each year that they do not want it. Any district board may also appoint a school nurse. Detailed reports are to be filed and copies sent to parents. The sanitary inspection of buildings is also a part of the work. All school buildings must meet certain hygienic conditions, and all two-story buildings must be fireproof. All deaf, dumb, blind, and mentally deficient children must be reported to the medical inspector for examination, and their proper education provided for.

All first- and second-class districts must provide a school term of 9 months, third-class districts of 8 months, and fourth-class districts of 7 months. All schools must be taught in the English language. Textbooks and supplies are furnished free by the districts. All children 6 to 21 may attend school, and all children 8 to 14 must attend a public or accepted private school every day the public schools are in session, except that in fourth-class districts the directors may vote to reduce the required time to 75 per cent of the school term. All children 14 to 16 not properly employed must also attend school, and those at work must possess employment certificates. Children 8 to 14 cannot be employed at any labor during school hours. All first-, second-, and third-class districts must appoint attendance officers, and fourth-class districts may do so.. Two or more districts may join in the appointment of an attendance officer, and the State Superintendent may withhold state funds from districts failing to enforce the law. No religious or political test can be required in the schools, and the requirement of separate schools for the negro race is forbidden.

Secondary Education. — Three classes of high schools are recognized, and state aid is granted for each class. A first-class high school must provide 4 years of instruction, a 9 months' term, employ at least 3 teachers, and receives a maximum state grant of $800. A second-class high school must provide 3 years of instruction, an 8 months' term, and employ at least 2 teachers, and receives a maximum state grant of $600. A third-class high school must provide 2 years of instruction, and receives a maximum state grant of $400. Any school district may establish a high school, as it sees fit, except that in fourth-class districts the approval of the county and State Superintendents must first be obtained. The course of study must be approved by the superintendent of the district or the county. Joint district high schools are provided for, with joint high school boards. Children not residing in high school districts, or full four-year high school districts, may attend neighboring schools, their tuition being paid by their home districts. All school districts have the same power to establish and support high schools as they have for elementary schools, there being no separate high school funds. The high schools have developed rapidly during the past ten years. In 1902 there were but 66 township high schools, while in 1910 the number had increased to 332. The same year there were 508 borough and city high schools. There were 125 first-class, 236 second-class, and 479 third-class schools in the state.

Higher Education. — The Pennsylvania State College (*q.v.*), located at State College in central Pennsylvania, is the only institution of higher learning maintained by the state. This institution, founded in 1859, offers instruction in agriculture, engineering, and household economy. The University of Pennsylvania (*q.v.*) receives some small state aid, but it is essentially a private foundation. The central high school in Philadelphia and the University of Pittsburg are municipal institutions. The state has a large number (34) of non-state colleges, mostly on religious foundations, twelve of which date back to before 1850. Some of these, as for example Muhlenberg, Dickinson, Lafayette, Haverford, Franklin and Marshall, Bucknell, Lehigh, Swarthmore, Washington and Jefferson, and Bryn Mawr (*qq.v.*), possess considerable property and offer a good grade of collegiate instruction. About one half of the number are open to both sexes, six are for women only, and one is for the colored race.

Special Education. — For the education of delinquents, dependents, and defectives, the state maintains, in whole or in part, the following special state institutions: —

Pennsylvania Industrial Reformatory, at Huntingdon.
Pennsylvania State Reform School, at Morganza.
House of Refuge, for Girls, at Darling.
House of Refuge, for Boys, at Glen Mills.
Pennsylvania Institution for the Blind, at Overbrook.
West Pennsylvania Institution for the Blind, at Pittsburg.
Pennsylvania Institution for the Deaf and Dumb, at Philadelphia.
West Pennsylvania Institution for the Deaf and Dumb, at Edgewood Park.
Pennsylvania Oral School for the Deaf at Scranton.
Pennsylvania Home for the Training of Deaf Children before they are of School Age, at Philadelphia.
Pennsylvania Training School for the Feeble-minded, at Elwyn.
State Institution for the Feeble-minded of Western Pennsylvania, at Polk.

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PENNSYLVANIA, THE UNIVERSITY OF, PHILADELPHIA, PA. — This university had its origin in a tract written by Benjamin Franklin, entitled " Proposals relating to the Education of Youth in Pensilvania." Soon after its publication, twenty-four public-spirited citizens of Philadelphia associated themselves for the purpose of establishing an academy, and " laying a Foundation for Posterity to erect a Seminary of Learning more extensive and suitable to their future Circumstances." The board chose Franklin for its president and directed him with the aid of the attorney-general to draw up a constitution. One of the first acts of the board was to secure the use of a building erected at Fourth and Arch Streets, Philadelphia, by a trust founded in 1740, and intended to serve for a " Charity School " and a " House of Publick Worship." For the latter purpose the structure was used in November of 1740, when Whitefield first preached in it; the charity school, however, was never set in operation. The trustees, in order that their trust might be carried out and the building " applyed to the good and pious uses originally intended," conveyed it, on February 1, 1750, to the trustees of the Academy by an indenture, which bound the latter to keep a " House of Publick Worship " and " one free school " for the instruction of poor children; but empowered them, so long as they preserved the aims of the original trust, to employ the property as they saw fit. In January, 1751, the Academy was formally opened. It embraced three schools, English, Latin, and Mathematical, over each of which sat a master, one of whom was rector of the institution. The Academy met with marked success, and upon application readily secured from Thomas and Richard Penn, the Proprietors, a charter in 1753.

William Smith, first Provost of the University, began his administration in 1755. The scope of the Academy rapidly widened. In 1755, at the request of the Board of Trustees, Governor Morris granted a second charter which confirmed the first, granted power to confer degrees, and changed the title of the board to "The Trustees of the College, Academy, and Charitable School of Philadelphia." The first commencement of the College, with a graduating class of seven young men, took place in May, 1757. After this its name and influence spread widely and it drew support from Maryland, Virginia, the Carolinas, and the West Indies. Dr. Smith planned the curriculum in 1756 to extend over three years, and to include Latin, Greek, mathematics, chemistry, philosophy, history, ethics, civil and international law. This plan laid the foundation for the educational system of the American college. Dr. Smith was a man of many interests, a church worker, an educator, a scientist, and at times an active politician. In the latter capacity he incurred the displeasure of the Provincial Assembly by an alleged libel against its privileges, and was thrown into jail, where he nevertheless continued to meet his classes. In 1759 he went to England for redress, and while abroad received honorary degrees from Oxford, Aberdeen, and Dublin. In 1762 he went again to England in the interests of the College. As the result of an appeal for aid to George III, to the Penns, and to the English people, he returned to America with slightly over £6000. This favor shown by George III later militated against the College, because it confirmed the feeling then existing that the College sided with Tory interests. Objections were made to the exercise of some of the rights under its charter. As a consequence of complaints, an act of Assembly in 1779 revoked the charters of 1753 and 1755, and formed a new corporation, "The Trustees of the University of the State of Pennsylvania." In 1789 this act was repealed, as a "violation of the Constitution of this Commonwealth," by a bill which once more secured to the College its privileges and franchises with Dr. Smith as Provost. But even thus the College and the University were separate, and there was not room for two institutions. The trustees of both accordingly applied to the assembly to have the charters of each surrendered, a new corporation created, and a board of trustees, representing both College and University, organized. The Assembly passed an act in September, 1791, uniting the University of the State of Pennsylvania and the College, Academy, and Charitable School of Philadelphia under the title "The Trustees of the University of Pennsylvania."

The new organization comprised three departments, the arts, medicine, and law. The department of arts embraced five separate schools under the care of six professors and their assistants. The medical school, the first in North America, had been founded in May, 1765, when Dr. John Morgan and Dr. William Shippen presented to the trustees a plan, approved by Thomas Penn, the Proprietor, for a course in medicine. Dr. Morgan was at once appointed Professor of the Theory and Practice of Physic, and Dr. Shippen, Professor of Anatomy and Surgery. In June, 1768, ten men were graduated with the degree of Bachelor of Medicine. By 1791 there were added to the medical faculty a chair of botany and materia medica and a chair of chemistry. The law school dates from 1790, when the trustees of the College elected to the first professorship of law in America Hon. James Wilson, then one of the Associate Justices of the Supreme Court of the United States.

Dr. Ewing succeeded Dr. Smith as Provost in 1791. During Ewing's administration the University moved from its old home on Fourth Street to a building on the West Side of Ninth Street between Market and Chestnut streets, erected by the legislature in 1791, before the removal of the National Capitol to Washington, as a home for the President of the United States. This the University bought in 1800, and occupied from 1802 to 1829, when it was replaced by two large buildings occupied respectively by the College and the Medical School until 1873, when the University removed to its present site in West Philadelphia. In 1807 Dr. Ewing died. The administrations of Provosts McDowell, Andrews, and Beaseley extended to 1828. In spite of attempted reorganizations, the classes diminished in size and public support ran low. Provosts DeLancey, Ludlow, Vethake, and Goodwin, notwithstanding their short administrations, brought to the University once more the spirit of progress and discipline. The enrollment increased, the law school was revived in 1850 by Judge Sharswood, and the auxiliary department of medicine founded in 1865.

It remained, however, for Dr. Stillé, who became Provost in 1868, to reorganize the administration. Dr. Stillé was a man of unusual zeal, energy, and insight. He revised the curriculum, and introduced on its adoption by the Board of Trustees in 1866 an elective system of studies. The Board of Trustees set about to increase the endowment. It suggested that the City should sell to the University at a nominal figure some twenty-five or thirty acres of the almshouse farm in West Philadelphia. Of this, part was to be a new site for the University, and part to be sold, as occasion should present, to increase the endowment fund. Ten acres of land were bought at $8000 per acre. On this new ground was laid in June, 1871, the corner stone of the present College Hall. In 1875 the department of science, founded in 1852, was endowed under the provisions of the will of John Henry Towne, Esq., and was thenceforth called by the Board of Trustees "The Towne Scientific School." Five and one half acres more were secured in 1872 for the site of a hospital, which through state appropriation was completed in 1874. A department of music was established in 1877, a department of dentistry in 1878. In 1877 the Charitable School was discontinued.

Dr. William Pepper became Provost in 1881 upon the resignation of Dr. Stillé. His term of office was a period of marked material and academic growth. Through enlargement of funds, creation of departments, and reorganization of faculties, Provost Pepper united the various departments of the institution under a comprehensive plan of administration. In 1881, through the generosity of Joseph Wharton, Esq., a School of Finance and Commerce was founded. (See COMMERCIAL EDUCATION.) To Dr. Pepper's activity is due in large measure the founding and equipment of the following departments or schools: the Graduate School, 1882; the School of Veterinary Medicine, 1882; the School of Biology, 1883; the Department of Physical Education, 1885; the Department of Archæology and Palæontology, 1889; the School of Hygiene, 1891; the School of Architecture, 1891; the Wistar Institute of Anatomy and Biology, 1892; the Museum of Arts and Sciences, 1894; and the erection of the University library building, 1889. Furthermore, he acquired twenty-five acres more in West Philadelphia and secured benefactions amounting to $2,500,000.

Dr. Charles Custis Harrison succeeded Dr. Pepper as Provost in 1894. In the seventeen years of his administration the University underwent phenomenal growth. Provost Harrison built up the University dormitory system, which to-day includes thirty houses. To his influence, zeal, and generosity is due the erection of numerous other buildings, — the John Harrison Laboratory of Chemistry, the new medical laboratory, the law school building, the engineering building, dental hall, the new veterinary buildings, the laboratory of zoölogy, the gymnasium, and Franklin Field. In 1910 the Henry Phipps Institute for the Study and Treatment of Tuberculosis became part of the University. Furthermore, sixty-nine acres of land were acquired by the University during Dr. Harrison's term of office, and more than ten million dollars raised for University purposes. Dr. Harrison was himself a liberal giver to the University, and established in the Graduate School the George Leib Harrison Memorial Foundation. Upon the resignation of Dr. Harrison in 1910, Dr. Edgar Fahs Smith, Vice Provost and Professor of Chemistry, became Provost.

The University of Pennsylvania is a corporation with a board of twenty-four Trustees, of which the Governor of the state is President, *ex officio*. The trustees are a self-perpetuating body, except that every third vacancy is filled by the nomination of the alumni. The Provost presides over the board, in the absence of the Governor, and directs the work of instruction and research of the University. The faculty is divided into six faculties, each presided over by a Dean. The Hospital, the Wistar Institute of Anatomy and Biology, and the Museum of Arts and Sciences are governed by boards of directors, under the general direction of the Trustees of the University. The enrollment of the University for the year 1911 was 5389, distributed as follows: The College (which includes Arts and Sciences, Architecture, Biology, Chemistry, Engineering Schools, Wharton School, and Music), 3720; Graduate School, 416; Law School, 347; the School of Medicine, 460; School of Dentistry, 462; the Veterinary Department, 154. These figures include 210 students from foreign countries. The student body is thus complex and cosmopolitan. The faculty of the University numbers 500. Entrance to the College is by examination and, only in the case of preparatory schools recognized by the university, by certificate. Entrance to the medical school presupposes at least two years of work in a recognized college, which must include special work in biology, chemistry, and physics. Admission to the law school requires of the candidate a B.A. degree, or satisfactory proof of fitness by preliminary examination. The annual budget of the University, exclusive of the hospital and of the erection of any new buildings, is $1,250,000.

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PENOLOGY, EDUCATIONAL ASPECTS OF. — The retributory theory of punishment and the death penalty have gradually retired into the background, and the educational purpose of penal institutions has correspondingly become prominent. While the primary and controlling end of the prison is to protect social order, security of person and property, the most competent practical men have come to see that society is best protected by reeducating the antisocial man in social habits, beliefs, and dispositions, if by sad mischance he has not been educated into a social character. Society breathes in comfort the hour the aggressive delinquent is safe inside the high walls; but this is from self-deception, for there is no guarantee of permanent immunity from harm until the criminal becomes a good citizen; and it is by a suitable educational process, conducted by capable teachers, that this inward change is brought about, if at all. If education fails, nothing is left but capital punishment or life servitude in prison for the confirmed and habitual offender or the weakling incapable of training for self-control and self-support.

It is now generally acknowledged that the deterrent factor, fear of punishment, has been greatly overestimated. Fear is a weak and fitful motive, and criminals are as a class short-sighted, reckless gamblers; they are ready to take chances, and the risk of detection and conviction gives zest to the game. If society insists on the deterrent factor in punishment, the dread of regular discipline under restraint will be all that is necessary to excite and sustain the fears of lawless men.

It is a mistake to regard the educational aim as inconsistent with the fundamental aims of criminal law, and to conceive of it as purely in the individual interest of the offender himself. On the contrary, the educator keeps in mind the necessity of awakening the conscience, remorse, the recognition of an objective social order, the sense of responsibility, the rights of the public which have been willfully violated. In this sense the words " punishment," " retribution," and " deterrence " have a meaning.

Foerster, Conti, and other antagonists of the " indeterminate sentence " insist that punishment should be measured out in prison days, fines, or otherwise, and not confused with education; although they have not shown clearly and convincingly that there is any common principle for making the " punishment fit the crime." They have, however, come to see and admit that, outside of and apart from retribution and expiation, society should try to reform the offender, — only not as a part of " retribution." They have not always told us clearly whether inside the prison the State should exclude all educational and reforming influences. Certainly industry, religion, and physical care ought to work toward improvement of the moral nature and fitness for honest labor outside. Any attempt to separate education from prison life must fail. If any one chooses to call one part of the period " expiation " and another part " reformation," he is welcome to his hair-splitting logic and metaphysical satisfaction; but in actual practice the distinction cannot change the modes of treatment. A criminal is a man, and every moment of restraint and pain should be a moment of moral discipline. Until the criminal accepts the aim of education as his own, it will seem to him pure punishment and may seem expiation. If the aim of personal amendment is accepted, the restraint and suffering will seem to him an opportunity. In any case society is for the time protected and has the power to prolong restraint so long as the offender is rebellious or dangerous; but the effort to train, teach, guide, inspire — " to educate " — must never for one moment cease. When society, in its punishment, ceases to try to reform and improve character, it lapses to that extent into barbarism; with its desire for vengeance or for compensation, the community assumes a self-corrupting attitude.

This profound change in the theory of punishment, which is going on throughout the civilized world, has begun to transform the prison, but especially the reformatory, into a school. The ideal of the warden or superintendent is slowly changing. Formerly this officer was selected with reference to his qualifications for exciting terror in the lawless and for using physical force to quell mutiny. In a well-built prison mechanical arrangements of walls, bars, and gates provide for security, and the process of education can go on inside with no more disturbance than in a high school; often with less noise and turbulence. The warden, under the best systems, is also relieved very greatly of the burden of marketing the product of prison industries and purchasing supplies; he has more time to direct the training of the prisoners; and more is expected of him in this direction. If this tendency continues, it will not be long until candidates for positions in penal institutions will be required to be graduates of normal schools and work up to the commanding position by experience in class work. Manifestly manual and trade training must be a large factor in the curriculum.

Gradually, in Europe and America, the reform school (*q.v.*) has been differentiated from the reformatory and prison. Only in backward communities is the youth under seventeen shut up with adult offenders in jail, even while awaiting trial. For wayward children and youth the penal institution has been transformed into a school having special facilities for dealing with various classes of youthful delinquents. Even bolts, bars, and walls disappear, except for the older group, which includes a few dangerous persons, and for those who are under discipline for offenses against the rules of the house.

The parental school (*q.v.*) has in some cities been introduced between the public school and the reform schools in order to give special discipline to truants and restore them to normal domestic relations without contact with more hardened offenders. This gradation and classification has been developed in advanced states in consequence of careful observation and experiment, and its value is beyond question.

Little need be said of the curriculum and management in reformatory education. It is true that the teachers must be acquainted with the physical and psychical characteristics of abnormal and subnormal children and youth, and be able to adapt certain special devices to their peculiar needs. It is also essential to have connected with every juvenile court a competent medical examiner with the training of a modern psychologist to study every young person who appears before the judge, in order to help in selecting the best course of training in each case; but this is true also of any other kind of school. In general the same preparation in psychology and principles of pedagogy is needed as that given in our best normal schools. But a period of residence and teaching in a reform school is necessary as an apprenticeship. The fact has been in the past that almost the only schools which had a full equipment for physical and manual training, with preparation for industrial skill and habits, were the reform schools and reformatories. Boys were compelled to commit crimes in order to get the education they most needed. The contrast between their behavior in an ordinary book and slate-pencil school and that in a good reform school proved the superior adaptation of the reform school curriculum and methods. Such a contrast could not continue. When the historian of education comes to pass judgment on the evolution of school methods of the nineteenth century, he will probably do justice to the part played by reformatory methods in improving the ordinary public school equipment and conduct. At the same time, especially since 1876, the ideas of Pestalozzi and Froebel, through kindergarten and manual training schools, have been carried over into state reformatory institutions, and there found a congenial soil and welcome. For judicial methods of dealing with delinquent children and the educational significance of these methods, see JUVENILE DELINQUENCY.

After more than a century of trial and reflection on experience, the modern mind has about come to this working theory of social necessity and duty: free public schools for all; compulsory attendance, enforced by suitable rules and agents; public relief when destitution renders parents unable to perform their duty; special schools for abnormal, subnormal, crippled, and delinquent children. Recently the conviction has become clear and decided that this policy, to be effective for the prevention of crime, must be extended to nearly the end of legal minority, — the stormy and perilous passage over the years of adolescence. Just when passion is strongest, conceit is most dangerous, desire for liberty most in need of bit and bridle, and parental control relaxed, society is peculiarly exposed to danger and loss. It is the crime age. The present watchwords of a preventive policy are: vocational schools, vocational guidance, vocational supervision and control, with community provision for recreation and social intercourse under wise supervision. Add to this, financial aid to destitute parents when necessary to make performance of their duty possible. These are among the essential factors in the most advanced and most adequate theory of crime prevention; and they must all be under the direction of school administration. There is no other organ of society properly equipped for this function. C. R. H.

See JUVENILE DELINQUENCY; INDUSTRIAL SCHOOLS; REFORM SCHOOLS; also CHILDHOOD, LEGISLATION IN CONSERVATION OF.

For references see the bibliographies to the articles referred to above.

PENSIONS, TEACHERS' (Retirement Funds). — As commonly used, the term pension signifies an annuity or other periodical payment made to an individual by a government, an institution, a company, a corporation, or an employer of labor, in consideration either of past services, or of the relinquishment of rights, claims, or emoluments. The governments of most civilized countries provide pensions for those disabled in military or naval service, and for their wives and families in the case of death; also for various state officers and public servants upon retirement from active service. European governments frequently grant pensions to artists, authors, inventors, etc., in recognition of eminent achievement, and to their widows and orphans when left in straitened circumstances. The rapid development, during the past quarter of a century in particular, of the system of state industrial insurance and old-age pensions has modified in a marked degree the significance of the pension. Under modern industrial and social conditions the pension has become an economic force of considerable moment. Each generation endeavors to qualify, through training and education, the members of the succeeding generation. These endeavors have produced the modern public school systems. Each generation also tends more and more to assume a social responsibility for the members of the preceding generation as they pass, by age or other cause, beyond the period of productive or effective activity. This social tendency has produced the modern pension systems.

Germany. — The oldest and best developed systems of teachers' pensions are found in various states of the German Empire. Voluntary systems more or less local in character have long existed there, but they have been completely overshadowed by public systems. Until well into the nineteenth century, so far as public provision was made, German public-school teachers were commonly pensioned at the expense of their successors in office. A superannuated teacher was assigned a fraction, usually one third, of the regular income of his former position till death. The new teacher was obliged to get along on the balance of the regular income so long as his predecessor survived. This scheme was replaced in the various states at different points in the last century by modern public pension systems. Contributions were required from teachers at first in most cases.

In Prussia, which comprises approximately two thirds of the empire, the great body of folk school teachers were pensioned under the old scheme until 1885, when a modern noncontributory pension system in favor of such teachers was introduced throughout the kingdom by a law of that year. This law was closely patterned after the civil-pension act of 1872, as amended in 1882, which applies to teachers in all public normal schools and all public secondary schools for boys in addition to state civil functionaries in general. In 1894 a similar act was passed affecting teachers in public middle schools and girls' secondary schools. These three acts, slightly amended occasionally, are very much alike in their provisions, so far as teachers are immediately affected. None requires contributions from teachers. The chief differences are on the side of public financial support, which varies from purely local through various combinations to purely state support. All pensions of folk school teachers are paid by the state up to 700 marks; the remainder is paid by county mutual associations of local school districts organized by law for that purpose. The laws under consideration apply to all full-time teachers. The regular conditions of eligibility are at least ten years of service and regular retirement by the proper educational authorities on account of permanent disability or after sixty-five years of age. The pension is graded according to teaching income and length of service. Its amount is determined at present by the following formula: $\left[\frac{1}{3}+\frac{1}{60}(\text{number of years of service between 10th and 31st})+\frac{1}{120}(\text{number of years of service between 30th and 41st})\right] \times$ [teaching income at retirement]. The range of the pension is thus from one third to three fourths the teaching income at retirement. In general the teaching income consists of regular salary plus free house rent or the equivalent in money. In 1906 there were 10,025 folk school teachers on the public pension roll in Prussia, of whom 8381 were men and 1618 women. The aggregate amount of their pensions was 15,007,764 marks. The average pensions of men and women were 1618 marks and 879 marks, respectively. The pension systems for public school teachers in the smaller states of Germany are similar to those in Prussia. The chief differences are in Bavaria, where contributions from teachers are still required, and where in general pensions are not graded according to salary, but are in absolute amounts.

Pensions have long been provided throughout Germany for widows and orphans of public-school teachers also, for most teachers in Germany, even in the folk schools, are men. The first agencies were voluntary mutual associations of teachers and special funds from philanthropic sources. Such agencies are still active, but they are now merely supplementary in a very small way to state pension systems. During the greater part of the last century the families of deceased folk school and middle school teachers throughout practically the whole of Prussia were pensioned, rather inadequately, from county pension funds, which all men teachers were required to join. At first the funds were supported almost entirely by the teachers, but the relative amount of public support gradually increased until 1889, when it became complete. Until 1882 the families of deceased normal school and secondary school teachers were pensioned through the agency of a state fund primarily for state servants, to which the teachers were required to contribute. By the terms of a series of laws and orders beginning in 1882 the widows and orphans of teachers in all public folk schools, middle schools, normal schools, and both boys' and girls' secondary schools are now pensioned on essentially the same basis, except for differences in the sources of support. With rare exceptions no contributions are required from teachers. In general a widow's pension is 40 per cent of the pension her husband was drawing or would have been entitled to if retired at the time of his death. The pension of a fatherless child is one fifth of the mother's pension, that of a parentless child is one third of the same amount. The sum of the pensions of a deceased teacher's family may not exceed his own. A pension lapses on the occasion of the marriage or death of the pensioner, and in the case of orphans at the age of eighteen. The present pension systems for widows and orphans in the smaller states were established on the whole much earlier than the fairly recent one in Prussia just described. They are quite similar to the Prussian system. The chief differences are again in Bavaria, and they correspond to those obtaining there in the case of teachers' pensions.

In general it has been customary for university teachers in Germany to retain their positions till death. When disability or old age has overtaken them, they have commonly been released from the duty of lecturing without loss of position or salary. The only loss has been in lecture fees. This plan prevails throughout Prussia to-day. In some of the smaller states, however, regular pensions are provided, graded according to salary and length of service. Pensions are also provided for the widows and orphans of German university teachers, chiefly through the agency of special funds maintained in connection with the several universities. Most of these funds are quite old. They have been supported from donations, state appropriations, and contributions from teachers. The contributions are in most cases no longer required. In a few universities widows and orphans are pensioned directly from university or state funds. Widows' pensions range from a small sum to about 2000 marks. Orphans' pensions are very much smaller.

France. — Prior to 1853 little was done in France in the way of pensioning teachers. Primary (public school) teachers were required to contribute to savings and insurance funds from which they received on retirement in a lump sum the total accumulated amount and proceeds of their deposits, while secondary and university teachers were required to contribute to a special state fund from which they were regularly pensioned on retirement.

Beginning in 1844 large mutual-aid societies of primary teachers have grown up in France, one of the chief activities of which has been the provision on a contributory basis of small pensions for their members, supplementary to civil pensions. They are voluntary organizations, subject to certain legal regulations. At present there is one such society in each department or county. The pensions provided have averaged only about 50 francs per annum.

In 1853 the present civil-pension law of France was enacted, which included in its provisions essentially all teachers engaged in public education of all grades, primary, secondary, and higher, except members of the teaching orders. All persons within the purview of the law were classified into two divisions, the active group and the sedentary group. The former consisted of functionaries whose duties were considered physically exacting. By the terms of the law all persons affected by it are required to pay contributions in support of the pension system as follows: (1) 5 per cent of the salary received each year, (2) one twelfth of the salary of the first year of service, and (3) one twelfth of each subsequent increase in the annual amount of the same. The general conditions of eligibility are thirty years of service, the attainment of sixty years of age, and, as the law has been interpreted and administered, regular retirement by the minister. For persons with fifteen years of service to their credit in the active group, the conditions are twenty-five years of service, the attainment of the age of fifty-five, and regular retirement. The normal pension is one sixtieth of the average salary during the last six years of service, multiplied by the total number of years of service. But for those serving twenty-five years in the active group, the annual pension is one fiftieth of this average for each year of service. Special provisions were made for pensions in certain cases of disability after a large part of the required service had been completed. The pensions of teachers may not exceed two thirds of the average salary upon which they are computed.

At first all teachers belonged to the sedentary group, but by a law of 1876 regular teachers in public infant schools, lower and higher primary schools, and normal schools were transferred to the active group where they have since remained. Further, this law provided that the pensions of these teachers should be computed on the basis of the six highest annual salaries received, regardless of their time and order. Minimum pensions of 600 francs for men teachers and 500 francs for women were established.

The act of 1853 also provided pensions under given conditions for the widows and orphans of all functionaries included within its purview. Prior to this time little worthy of mention had been done in favor of the widows and orphans of teachers or other officers, and little has been accomplished since apart from the requirements of the law of 1853. Voluntary and philanthropic activities in this field have been meager in comparison with those in Germany. The law of 1853 conferred the right to a pension upon the widow or parentless children of any functionary who was either drawing a retiring pension under that act or had completed the period of service required for eligibility to such a pension at the time of his death, provided the marriage occurred at least six years before the cessation of the husband's functions. The widow's pension is one third the pension the husband was drawing or would have been entitled to if he had retired at the time of death. Whenever from death or other cause the widow's pension is no longer paid to her, it is divided equally among her surviving children under twenty-one years of age. In case a widow stands in the relation of stepmother to surviving orphans the regular pension is shared between the widow and children. By virtue of a decision of the Council of State in 1882 the children of deceased women functionaries have pension rights corresponding to those enjoyed by the orphans of male officers. This is of considerable importance in this connection since women teachers now slightly outnumber the men in the public schools of France, and many of the women are married.

On Jan. 1, 1909, there were 21,051 retired teachers on the civil-pension roll in France. They were receiving an average annual pension of 1220 francs and in the aggregate an annual sum of about 25,685,000 francs. About 18,966 of these teachers had been retired from the field of public primary education with an average pension around 1052 francs. The remainder were secondary and university teachers. On the same date there were 10,158 teachers' widows and orphans in receipt of pensions aggregating 4,306,042 francs per annum.

Great Britain. — The activities of mutual-aid or friendly societies and philanthropic agencies in pensioning public school teachers in Great Britain have been almost negligible. A limited number of pensions are paid under certain conditions to retired teachers in destitute circumstances from the Benevolent and Orphan Fund maintained by the National Union of Teachers. A few pension annuities are purchased by teachers on favorable terms through a pension fund maintained by the Teachers' Provident Society, affiliated with the National Union.

Long before pensions for teachers were established by direct legislation in Great Britain they were provided on a small scale by the Committee of Council on Education established in 1839 for the purpose of superintending the expenditure of funds voted by Parliament in aid of public education. These pensions were for the purpose of relieving the schools of incapacitated teachers. Little was accomplished until 1875, when the pension system was revived after a suspension of thirteen years by joint action of the two Committees of Council on Education for England and Scotland. In 1898, when the present pension law in favor of public school teachers was passed, there were in effect in England and Wales 219 pensions of the Committee of Council of 30 pounds per annum, 668 pensions of 25 pounds, and 732 of 20 pounds. The total expenditure for the year was roughly 36,000 pounds. The total expenditure in Scotland during the same year was approximately 5400 pounds. In 1906 the pension system under consideration was discontinued in England and Wales.

In 1898 Parliament passed the Elementary School Teachers (Superannuation) Act in accordance with which certificated elementary teachers have since been pensioned in England and Wales and until 1912 in Scotland. The act requires all certificated teachers while serving in public elementary schools to contribute to a deferred annuity fund at minimum rates of three pounds per year for men and two pounds for women. The rates of contribution in 1911, fixed by the Treasury under the act, were three pounds ten shillings for men and for women two pounds eight shillings in England and two pounds in Scotland. On attaining the age of sixty-five, when his certificate is to expire, every teacher is entitled for the remainder of his life to such annuity from the deferred annuity fund as his contributions have earned in accordance with annuity tables fixed under the act. Further, on attaining the age of sixty-five, if one half the years since certification have been spent as a teacher in public elementary schools, the teacher is entitled to a life-long superannuation pension from the state at the rate of ten shillings for each year of the specified service. If a certificated teacher who has served in public elementary schools for at least ten years and during one half the years that have elapsed since his certification, is found to be permanently incapacitated for the efficient performance of his duties, he is eligible under certain rules to receive a disability pension from the state. A teacher who accepts a disability pension forfeits his right to an annuity from the deferred annuity fund, unless he later reënters the service. In 1909 there were 936 men and 688 women teachers in England and Wales in receipt of superannuation pensions aggregating 33,261 pounds and 18,525 pounds respectively. Also 406 men and 1205 women were drawing disability pensions amounting to 14,606 pounds and 30,306 pounds respectively. The figures for Scotland were about one tenth of these on the whole.

In 1912 the act of 1898 was displaced in Scotland by a new pension scheme formulated under the provisions of the Education (Scotland) Act of 1908. The new scheme includes all teachers in elementary and secondary schools in receipt of Parliamentary grants. It is supported chiefly from public funds. Teachers are assessed four per cent of their salaries annually, but these contributions may be returned in full on application if the teacher withdraws from the service. Ten years of service are required for eligibility to a pension, which amounts to $1\frac{2}{3}$ per cent of the average annual salary throughout the period of service, multiplied by the number of years of service. Teachers may retire at the age of sixty and must retire at sixty-five. Disability pensions may be awarded after ten years of service.

Except in Scotland pensions have never been provided to any material extent for secondary and university teachers. In Scotland such teachers have been pensioned to a considerable extent by the institutions employing them. As just noted, the new pension scheme in Scotland includes secondary teachers.

Widows and orphans of teachers are not pensioned in Great Britain except to a very small extent by a few voluntary organizations.

United States. — Relatively little has been done in the United States in pensioning teachers in comparison with what has been accomplished in European countries. In fact until the end of the nineteenth century the only pensions generally recognized as such in the United States were those paid by the federal government on account of military or naval service. Aside from the provisions made by many municipalities for members of the police and fire departments, pensions for public school teachers have been the first of what ultimately promises to become a complete system of civil service pensions.

According to the sources of the funds and the methods of administration, teachers' pension schemes in the United States may be classified into four principal forms: (1) Private-voluntary; (2) Quasi-public; (3) Semi-public; and (4) Public.

Private-voluntary Systems. — The working of the social law of mutual aid for common defense and protection has produced a number of voluntary associations of teachers. There are two principal varieties of these associations, — the mutual benefit association for temporary aid and the fraternal insurance society. While the first variety should not, strictly speaking, be classified as a pension scheme, the organization and inherent motive seem to warrant its consideration in this connection. Examples of this variety exist in Baltimore, St. Louis, Cincinnati, Cleveland, Detroit, Chicago, Buffalo, San Francisco, and St. Paul. Through initiation fees, annual dues, and special assessments, these associations aim to pay sick benefits and in some instances funeral expenses. The second and more typical variety of the private voluntary organization seeks through the payment of assessments, proportional to salary, to provide small annuities to superannuated and disabled teachers. Examples are to be found in several of the larger cities of the country, — New York, Boston, Philadelphia, Baltimore, St. Louis, and Cincinnati. Certain of these annuity associations make provision for temporary aid also. In some instances these associations are state-wide in their operation (Connecticut Teachers Annuity Guild; Massachusetts Annuity Guild).

The voluntary aid and annuity societies have reached but a small proportion of the public school teachers, even of the localities or states in which they have existed. The development of schemes of a public nature has removed the chief causes that brought the private voluntary organizations into existence.

Quasi-public Systems. — The fundamental characteristic of this class of schemes is the legislative authorization of the creation of funds through assessments, either voluntary or compulsory, equal to a certain percentage of the teacher's salary; and the administration of the fund by public officials. While there is no direct public appropriation to the fund of the quasi-public schemes, deductions of salary on account of the absence of teachers are frequently added to the salary assessments. Further increments arise through donations and bequests. Many of the existing municipal teachers pension funds are organized in general accordance with this scheme.

Semi-public Systems. — In the semi-public schemes the basis of the fund is an assessment on the salaries of teachers. To this, however, the state adds a definite appropriation either directly or indirectly through the municipality. This appropriation may be in the form of a fixed amount or a specified tax levy. The contemporary development of state and municipal pension schemes is distinctly toward this type. The Wisconsin law of 1911 (ch. 323) establishing a "Teachers Insurance and Retirement Fund" is illustrative of the trend. This law provides a state scheme to be administered by a board of trustees consisting of the state treasurer, the superintendent of public instruction, and three other members, one of whom must be a woman, to be elected by the members of the fund. Ten cents per capita of the school population of the state is to be annually reserved for the fund from the seven tenths mill state school tax. Teachers must contribute to this fund one per cent of their salaries during the first ten years of service, and two per cent thereafter. Teachers already in service may or may not accept the provisions of the law at their option; but teachers entering the public school service after Sept. 11, 1911, accept the provisions of the law in accepting appointment. Annuities amount to $12.50 for each year of service, the maximum being $450. Retirement may be made after twenty-five years of service as a teacher, eighteen of which must have been in the public schools of the state; or, upon permanent physical and mental disability, after eighteen years of service in the public schools of the state. The city of Milwaukee already having a retirement fund, the law does not apply to that city.

The compulsory membership frequently provided in the semi-public and quasi-public schemes has given rise to several judicial determinations of the constitutionality of such a provision. The principal ones of these cases are: *State, ex rel. John L. Ward* vs. *Franklin Hubbard, et al.*, 12 Ohio Circuit 87, 64 N.E. 109, a case arising in Toledo (O.), wherein it was decided that the compulsory provision of the Ohio law was invalid; and *State, ex rel. Jennison* vs. *Rogers*, 87 Minn. 130, 58 L.R.A., a somewhat parallel case, arising in Minneapolis under the Minnesota law, resulting in a similar decision. On the other hand, the supreme court of New Jersey, *Allen* vs. *Passaic Board of Education*, 81 N.J.L. 135, maintained the constitutionality of such a compulsory provision.

Public Systems. — This provides a true pension. There is no assessment. It is intended to operate automatically for all public school teachers. This form of pension system exists in Rhode Island and in Maryland. In the former state, by the act of 1907, teachers sixty-five years of age, having thirty-five years of service, twenty-five years of which have been in the public schools of the state, may be retired and receive from the state an annual pension equal to one half of their annual contractual salary during the last five years before retiring. Such annual pension may not amount to more than five hundred dollars.

Pension funds for public school teachers established on the quasi-public, the semi-public, or the public basis, exist in twenty-three states, — California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kansas, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Utah, Vermont, Virginia, and Wisconsin. Some of these schemes are state-wide in application, while others are operative as to individual cities or certain classes of cities. The following list is illustrative of these municipal schemes: San Francisco, Denver, New Haven, Wilmington, Chicago, Indianapolis, New Orleans, Baltimore, Boston, Detroit, Minneapolis, St. Paul, Duluth, Omaha, New York, Albany, Buffalo, Elmira, Rochester, Schenectady, Syracuse, Troy, Yonkers, Cincinnati, Cleveland, Columbia (O.), Portland (Ore.), Philadelphia, Harrisburg, Pittsburgh, Providence, Charleston (S.C.), Salt Lake City, and Milwaukee.

Previous to 1905, no general provisions existed for the pensioning or retirement of the members of the instructional staff of higher institutions of learning in the United States. Certain of the larger universities, such as Harvard and Columbia, maintained a limited system of retiring allowances. A small number of the state universities and colleges sought to accomplish in part the end of a pension system through the establishment of emeritus professorships, the holders of which received a reduced salary in return for merely nominal service. With the establishment of the Carnegie Foundation for the Advancement of Teaching (*q.v.*) a general system of retirement of superannuated teachers came into existence, not only to benefit a large number of American colleges and universities, but also to stimulate public endeavor in behalf of pension funds for teachers in public elementary and secondary schools. R. W. S. and E. C. E.

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(Summaries of current legislation and reviews of developments of teachers' pensions in the United States and Europe.)

PENTATHLON (Gk. πένταθλον; Lat. *quinquertium*). — The five contests which made up the greater part of Greek athletic exercises. There were included: (1) *Running* (Stadion or 200 yards, quarter-mile, and long distance, three quarters of a mile to three miles). Races were often run in armor, and over soft sand. (2) Jumping on soft earth, often with the aid of grips or dumb-bells (*halteres*). The contestants must alight evenly for the jump to count. (3) Wrestling and boxing. The bodies of the contestants were naked and oiled, and the contest took place on soft ground. (For further details see the separate articles on these topics.) The pancratium (παγκράτιον) was a mixture of wrestling and boxing, and the contestants could use almost any device to win. (4) Throwing the discus, a flat disk of metal, eight to nine inches in diameter. (5) Hurling the spear or javelin at a target.

See Greek Education; Gymnasium; Palæstra.

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PEOPLE'S HIGH SCHOOLS. — See Adults, Education of; Denmark, Education in; Norway, Education in; Sweden, Education in.

PEOPLE'S INSTITUTE, NEW YORK. — An organization founded in 1897 by Charles Sprague Smith, formerly professor of languages and literature at Columbia University, for the promotion of better understanding and coöperation between the members of different classes in society and different religions. The promotion of social solidarity and social consciousness was to be the chief aim of the Institute. To this end a series of lectures has been organized to distribute better information on the duties of citizens and the various branches of civic and state government. The following are the chief departments into which the work of the Institute is divided: (1) People's Church, meeting every Sunday evening to hold a service, irrespective of creed and based on the fundamentals of religion. (2) People's Forum for the discussion of questions of general interest in politics and social legislation. (3) People's Choral Union and People's Symphony Concert Association to enable those who could not otherwise afford it to hear and study the masterpieces of music. (4) Dramatic recitals and performances are also provided in the same way. Arrangements have been made between the Institute and theater managers by which members of the Institute are enabled to secure tickets at reduced rates. In this way the Institute indirectly acts as censor of plays. Instruction is also given in literature, art, natural science, and philosophy. (5) The People's Club was organized to provide centers for social intercourse and recreation for both men and women. The work of the People's Institute with the exception of this club is carried on at the Cooper Union (*q.v.*).

PEOPLE'S PALACE. — An institution organized in 1887 to afford facilities for recreation and education to the people of the East End of London. Its establishment was made possible by a fund left in 1840 by J. B. Beaumont to promote education and entertainment in the East End. The fund was mismanaged until it was taken in charge by Sir Edmund Hay Currie, who added to it by securing gifts and endowments. Meanwhile *All Sorts and Conditions of Men*, the novel by Sir Walter Besant (*q.v.*), appeared in 1882, and attracted considerable attention to the needs of an almost unknown section of London. His suggestion for the "Palace of Delight" proved of great assistance to Sir Edmund Currie and his associates. Sir Walter, as a trustee of the Palace, took an active part in its work. At the same time the establishment of Polytechnics (*q.v.*) in London afforded good models to be followed on the educational side. Queen's Hall, a large concert hall equipped with an organ, a large stage, and a seating capacity of 4000, was opened by Queen Victoria in May, 1887, as part of the scheme. In October evening classes, workshops, laboratories, gymnasium, refreshment and recreation rooms were opened in temporary buildings. In the first year there was an enrollment in the classes of nearly 5000 students. Membership in the institute with free admission to everything but the classes and swimming bath (opened in 1888) was limited to young people of both sexes between sixteen and twenty-five. A Junior section was soon established for those between thirteen and sixteen. The Palace provided concerts, exhibitions and shows, billiard and social rooms, a reading room and library, and clubrooms. Through the support of the Drapers' Company and the Charity Commissioners, financial responsibility for the provision of education was removed from the trustees of the Palace. A day technical school for boys over thirteen preparing for the mechanical industries was opened in 1888 in new buildings. The educational work of the Palace soon grew to such an extent that it was organized into the East London Technical College, now the East London College, a school of the London University (*q.v.*).

See POLYTECHNICS, LONDON.

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PERCENTAGE. — A topic that began to find place in arithmetic after the invention of decimal fractions. (See FRACTIONS.) The idea of percentage is, however, an old one, and many traces are found in the records of Babylon, India, Greece, and Rome, showing that computations were frequently made on the basis of a hundred. The word comes from *per centum*, "by the hundred," and since a hundred is a very natural group unit to take for larger business computations, it is not strange that it should have been used even before the convenient decimal fraction appeared. The common per cent sign (%) is a cursive form derived from $\overset{o}{c}$, for *cento*, which appears in the *per* $\overset{o}{c}$, or *per cento*, of the Italian writers of the fifteenth century. By the seventeenth century the Italians wrote $p\,\frac{o}{o}$, and when the symbol became international the original meaning was forgotten and merely the sign % was left.

Educationally there is no reason for discussing percentage as a separate topic of arithmetic, save as tradition dictates. The expression 6 % has no other meaning than 0.06; it is merely a different symbol and might just as well be taught in connection with decimal fractions, so far as the theory goes. Since, however, business problems in which per cents arise are generally too advanced for a child who may properly be considering decimals, it is probably better to postpone the use of per cents until these problems are reached. But even then it is not necessary to give an elaborate treatment of the theory of percentage before the application of per cents is introduced. This is now coming to be appreciated in the treatment of percentage, the extensive discussion of the various "cases," as seen in the arithmetics of the second half of the nineteenth century, having been abandoned of late. There is a reason for retaining the term *rate*, and some reason for using *base* as a non-technical term, but there is no educational necessity for retaining *amount* and *difference*, and not much need for the term *percentage* as meaning the product of the base and rate. Whenever the simple equation, merely in the form of 0.06 of $x = \$12$, becomes familiar in the elementary school, all of these terms, excepting *rate*, will doubtless disappear.

The elaborate applications of percentage as seen in the arithmetics of about 1875 are at present giving place to only a few that are within the grasp of children in the seventh school year. The chief applications are to discount, commission (brokerage), and simple interest. D. E. S.

PERCEPTION. — This term is used in educational writings in a narrow and technical sense. It is also employed in a broader sense in general psychology and in common parlance. The influence of Herbartian writing is accountable for the narrow technical sense in which the term is used in educational literature. It is contrasted with the term "apperception." While apperception indicates clear active mental processes, "perception" as used in this connection refers to vague and relatively passing mental processes. The two terms "apperception" and "perception" were first used by Leibnitz. The same terms were afterwards used by Herbart, and are used in current German psychological discussions, especially by such writers as Wundt. There is no confusion in the German language between the German word *Perception* and the more general vernacular term *Wahrnehmung,* whch is used in German to indicate sense perception. The German word *Perception* is, therefore, always a technical specialized term related to the term "apperception." When the term is brought over into English in the Herbartian psychologies as a term contrasted with apperception, an ambiguity of a very confusing type arises. As used in the English language, the term "perception" does not mean at all a vague and relatively passive form of experience, but it refers to a very active and usually vivid type of experience. The translators of Herbartian terminology would therefore have rendered a distinct service to educational terminology by the use of some word other than the English word "perception" to translate the German word of the same form. Some such term as apprehension or vague recognition would have been very much better. The former is employed in the translation of Wundt's *Outlines of Psychology.*

In the broader and more general sense, the term perception refers to the mental experience which arises whenever one recognizes some object that is presented to the senses. Thus one perceives the table upon which he writes, etc. In this general sense, the word perception is to be contrasted with two other psychological terms which define the limits of perception on two opposite sides. Sensation is the first term to be distinguished from perception. Sensation is the relatively simple experience which one derives from the stimulation of his senses. Thus one has sensations of red or green, but his recognition of a red or green surface is more complex than his mere reception of the sensation of red or green. The recognition of a surface implies the contrasting of the sensations derived from this surface with those that are derived from the general background upon which the surface lies. The percept of a surface always has, in addition to color qualities, certain spatial characteristics. Not only so, but the recognition of the object usually depends upon some earlier experience with the object. They are therefore interpreting factors drawn from past experience which are added to the present sensory qualities. Thus, the recognition of the surface of the table is supplemented by earlier knowledge of what a table is and of its uses and of its value. Perception may therefore be described as a complex of sensations and memory experience. On the other hand, perception is to be distinguished from ideas. Ideas are those experiences which one has in the absence of objects. One has an idea of the friend whom he saw yesterday, or of the book which he read last year, while he may perceive the friend who is now before him or the book which he is actively engaged in reading. Ideas are constantly employed to supplement perceptual processes, but ideas differ from percepts in that they are largely under the control of the mind, while percepts offer a certain resistance to subjective modification. One cannot change at will the recognition which he has of a present object; he can, on the other hand, form a series of ideas all giving to the same object different colors or different positions. As contrasted with ideas, percepts may be described as composed in major part of sensory elements, while ideas are made up entirely of memory elements.

The properties exhibited by percepts are due in part to the elements which enter into the percepts, and in part to the process of combination by which these elements are united with each other. Thus, a visual percept is dependent for certain of its attributes upon the visual sensations of which it is composed, but these visual sensations are arranged in an orderly fashion, and are fused (see FUSION) with tactual sensations and motor sensations and memory factors. The orderly arrangement of all of these sensations gives rise to the spatial, temporal, and other characteristics of the percept. Form and size are therefore the products of perceptual fusion, and cannot be reduced to any simple sensory factors. In the same fashion, the unity which a percept exhibits is not dependent upon any of the single sensations which enter into it, but rather upon the perceptual process itself. A chair or table is made up of different parts, but all of these different parts are recognized as belonging together. This unity of the experience can be explained only by recognizing the fact that in all human treatment of such complex articles, there is a unity of reaction and adjustment which is paralleled by the unity of mental recognition. Finally, all percepts have position in time, and the time series, like the space series, is the product of the complex process of perception.

The processes of perceptual fusion are so immediate in their character that it has often been assumed that no education of these processes is necessary. The ideational processes, which move more slowly, have been observed by students of mental development, and the training of these ideational processes, as, for example, in the various forms of memory, has always been recognized as a part of education. When a person fuses his tactual and visual sensations with each other in the formation of a percept, there is no such obvious step from the one group of elements to the other as there is in a series of ideas, and no such evident necessity of assistance from a teacher who can guide the process. For a long time, the school held itself entirely free from responsibility for training the recognition of space, time, and the unity of objects. Experience has shown, however, that children cannot learn fully and accurately to recognize form, size, time, and unity, without some well-directed exercises which aim to train the powers of perception. There is, therefore, at the present time, a strong tendency to introduce into the school program special exercises in sensory training. The above discussion makes it clear that it is not the senses which are trained in this case, but rather the fusion processes which combine sensory experience.

Another reason for the earlier omission of perceptual training is to be found in the fact that certain experiences such as those of space have been reduced in the form of geometry to a system of ideas rather than to a direct form of training of the visual perception. For this reason, a new type of geometry is needed in the lower schools which shall give training in the recognition of space without reducing this experience to abstract ideas. In drawing and in æsthetic training much has been done to improve the powers of perception and the ability of students to discriminate between those forms which are symmetrical and beautiful and those which are irregular. This type of training cultivates space perception as contrasted with Euclidian geometry, which deals with logical comparison.

The importance of the recognition of perceptual processes as significant to the teacher goes very much further than the introduction of the special exercises above described. The necessity of a psychological analysis of all mental processes becomes increasingly obvious as one studies the various forms of perceptual fusion. Fusion is significant because it is not explicitly distinguished by the mind from the elements that are united with each other. It is a kind of involuntary and unrecognized mental development. As soon as teachers begin to note this type of perceptual activity as of importance in mental development, a whole field of psychological investigation is opened up which would be entirely overlooked if one recognizes only the mental processes of an ideational type. C. H. J.

See Object Teaching.

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PERIOD, LESSON. — See School Management.

PERIOD OF STUDY. — The fundamental importance of the problems connected with the period of study both for hygiene and for efficient school work is now recognized, but they are, for the most part, unsolved. We do not know, for example, whether, other conditions being the same, it is better for the health of children and the habits developed to have all the school work done in one session or in two. We do not know whether for the majority of children under usual conditions it is better to have school work done in the morning or in the afternoon, or whether there are two types among children as suggested by the experiments of Kraepelin, those who do better work in the morning on the one hand, and those who do better work in the afternoon on the other. Experiments by Lay with a group of children learning nonsense syllables showed that every child retained what was learned better when the study was in the afternoon than when it was in the morning; but fatigue, on the other hand, seems to be greater in the afternoon. Thus, in regard to the many points, we have no adequate evidence as to the best conditions. Significant results have come from many experimental studies, but as regards the length and distribution of the period of study during the school day, the best conclusions that can be given at present are tentative. Putting these briefly and dogmatically on the basis of the studies of work and fatigue, and upon the results of school practice in different countries, the following norms seem wise: —

(1) The length of the school day should vary with the age of the children, and the kind of work done. For the kindergarten and early primary grades one session of three hours is a maximum unless a large part of the work consists of play and is out of doors. In the higher grades and in the high school a four-hour session, or two sessions with a total of five hours, or where much of the work consists of manual training, gymnastics, or the like, six hours, should be a maximum. (2) The problem of one session or two is relative to many conditions. One session a day seems preferable where local conditions favor. (3) There should be no prescribed home study in the lower grades; in the higher grades and in the high school the amount required should not exceed one hour, unless there is only one session not exceeding four hours. (4) The recitation period should not exceed fifteen to twenty minutes for children between six and nine; twenty-five to thirty minutes for children from nine to twelve; thirty-five to forty

minutes for children from twelve to fourteen; forty to forty-five minutes for older children. (5) Recesses of from five to fifteen minutes in length should follow each period of study, the length of the period being determined by the character of the preceding work, the time of the day, the sequence of subjects, and the like. The total time for recesses for a five-hour period should not be less than that required in Berlin; namely, sixty minutes. The amount of time devoted to recess in this country is usually very inadequate. More time for recess and a better pace of work in most schools would not only favor health but produce more satisfactory results.

Hygiene and pedagogy are quite in accord, and for really efficient school work in most of the schools in this country an entire revision of the program with regard to what is known concerning fatigue and the optimum conditions for intellectual work is desirable. In order to determine the proper length and distribution of the work, many factors are to be considered, — the age of the pupils, the climate, the season of the year, the kind of work done, the home conditions, the sequence of subjects, the work required, the character of the teachers, and the hygienic conditions of the schoolroom.

W. H. B.

See Home Study; School Management; Fatigue.

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See also references under Fatigue.

PERIODICALS, EDUCATIONAL. — See Journalism, Educational.

PERIPATETIC SYSTEM. — See Department System.

PERKINS, GEORGE ROBERT (1812–1876). — Author of mathematical textbooks; studied privately mathematics and civil engineering. He taught at Clinton, N.Y. (1831–1838); was principal of the Utica High School (1838–1844); instructor in the Albany Normal School (1844–1848), and succeeded David P. Page (*q.v.*) as principal of that institution (1848–1852). His publications include *Higher Arithmetic* (1841), *Treatise on Algebra* (1841), *Elements of Algebra* (1844), *Elements of Geometry* (1847), *Trigonometry and Surveying* (1851), and *Plane and Solid Geometry* (1854). He also published many scientific articles.

W. S. M.

PERMANENT SCHOOL FUND. — See School Funds.

PEROTTI, NICCOLO (1430–1480). — Italian ecclesiastic and humanist, born at Sassoferrato of poor parentage. At the age of fourteen he became a pupil of Vittorino da Feltre (*q.v.*). Later he is found in the household of William Gray, later, Bishop of Ely, who studied under Guarino. With him he went to Rome and was placed in the household of Bessarion, whose secretary he became. Living at Bologna he studied theology and Greek, and taught rhetoric and poetry there in 1451. He attracted attention when Pope Nicholas requested him to translate Polybius, a work executed with more elegance than correctness. In 1458 Pope Pius II made him Bishop of Siponto. Perotti was frequently employed as Papal legate, but spent the greater part of his time in Rome engaged in literary activity. The latter part of his life he spent in his native town.

While Perotti was very productive, only a few of his works have been printed. His main interest was in rhetoric and eloquence. The *Metrica* (1453) was the earliest modern work on Latin prosody. His *Rudimenta Grammatices* (1468) was the best known and most widely used of his works. Erasmus calls it the "most complete manual extant in his day." It was the archetype of all later grammars with the familiar arrangement of accidence, syntax, and prosody. Grammar he defines as *ars recte loquendi rectique scribendi scriptorum et poetarum lectionibus observata.* The *Cornucopiæ sive Latinæ Linguæ Commentariorum Opus* was a collection of some of Perotti's works edited by his nephew, Pirro, and contained in later editions commentaries on Martial, Pliny's preface, Varro, Sextus Pompeius, and Nonius Marcellus. Perotti was an ardent student of Greek, and besides Polybius he also translated Epictetus and Plutarch (*On the Fortune of the Romans*). His *De Puerorum Eruditione*, which would have been valuable as from a pupil of Vittorino, has either been lost or was never printed.

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PERSIAN EDUCATION. — In the history of education Persia commands attention both as having been one of the great nations of antiquity and as having possessed in early times an educational policy that engaged the consideration of advanced thinkers, like Herodotus, Xenophon, Strabo, and others, in ancient Greece. The intellectual achievements of the people, moreover, during their long history have been such as to entitle the land to a high rank among the Asiatic nations of the past; and there is still some hope that under its constitutional government, as framed in 1906–1909, the country may in a measure be enabled to emulate some of the achievements of days gone by.

Historical Outline. — Of chief interest historically to the student of education is the older period of Persia's development, or that during the thousand and more years of her greatest power; in other words, the period from the seventh century B.C. to the seventh century A.D. This was the long era covered by the Median and Persian empires down to the invasion of Alexander the Great, and followed by the dominion of the successive rulers of the Parthian and Sasanian Kingdoms. During most of this early age Persia was under the influence of the religion of Zoroaster, the prophet of ancient Iran, who was born at least as early as 660 B.C., and whose faith and teachings were destined to have an educational bearing upon the general condition of the people. This older creed, whose ethical principle of the warfare between Ormazd and Ahriman proved a potent factor in energizing the people, was supplanted and almost wholly driven out by Mohammedanism when the Arab conquest of Persia took place in 650 A.D. From that date onward the country in general shared in the educational as well as the political fate of the adjacent lands that were brought under the sway of Islam. Yet Persia always maintained a certain freedom of thought and independence of judgment that redounded to her intellectual advancement during the succeeding centuries of Moslem rule. In fact many of the products of Oriental learning during the Middle Ages which Europe attributes to the Arabs are not Arab, except in language, but are in reality the work of Persians by birth or extraction (cf. Browne, *Literary History of Persia*, 1. 251–278, London, 1902). A recognition of this truth should play a part in any estimate of Persia's development in later times as well as in any forecast regarding the possibilities of the country when the land is brought into more direct contact with the West and with Occidental modes of thought.

Educational Views and Aims. — From the remotest age the aim of education in Persia, as elsewhere, was to train children in such a manner as to make them useful members of the community in whatever state of life they may have been born. A certain amount of religious instruction was regarded as a paramount necessity for the attainment of this end, as is implied in the *Avesta* (Vend. 4. 44–45, Yasna 62. 5, Yasht 13. 134; tr. Darmesteter and Mills in *Sacred Books of the East*, vols. 4, 23, and 31, Oxford, 1880 (2d ed., 1895), 1883, 1887). Among the qualities most highly prized and extolled in that sacred book is the gift of wisdom and knowledge; this is spoken of both as natural wisdom and as acquired — Av. *āsna khratu*, "inborn wisdom," and *gaoshō-srūta khratu*, "ear-heard wisdom." A special section of the Avestan code, but one unfortunately lost ages ago, was devoted to "the teaching of children by a guardian or father, and the mode of his teaching," and also to "the association of priestly instructor and pupil," as shown by this very quotation from an analysis of the missing part found in the *Dinkart* (8. 22. 2; 8. 37. 4, tr. West, *Pahlavi Texts*, in *S.B.E.* 37. 77, 114). The loss, in fact, of much of the *Avesta* in its original compass makes it difficult to surmise how broad may have been the vision or how comprehensive the educational aim in those ancient days. If again we may judge from the summary in the *Dinkart* just referred to there was imparted, besides religious instruction, something of science, as it was then known, and likewise of secular knowledge. Further support for this view is to be found in the occurrence in Pahlavi literature of quotations of that nature from missing portions of the *Avesta*, and in some of the old material used in Pahlavi works, like the *Bundahishn*, which is based on the *Avesta* (cf. West, *Pahlavi Texts Translated*, in *S.B.E.* 5, p. xxiv). It is at this point that some outside help may be called in from the classic authors, like Herodotus, Plato, Xenophon, and the rest quoted below, to contribute further information at least regarding the general conditions prevailing in Achæmenian, if not Median, times. In this connection it may be added that, although opinions differ concerning the weight to be given to Xenophon's *Cyropædia* as a source, there are not wanting sound critics who regard that work as thoroughly trustworthy in its representation of Persian conditions, even though it be tinged in color by Greek ideals. For the Parthian period (250 B.C.–226 A.D.), or the darker age that followed the invasion of Alexander, there is a scantiness in material to show the educational attitude of that epoch. For the Sasanian age (226 A.D.–650), on the other hand, there is abundant evidence to prove that learning was valued at its true worth and was liberally fostered. To cite an example in addition to the other quotations given below, the *Dinkart* says, "Education is the life of mankind," and "Men ought to raise themselves to illustrious positions by education (which enables them) to read and write" (see tr. by Peshotan Sanjana, and Darab Sanjana, vol. 12, p. 29 and vol. 9, p. 585). After the Mohammedan conquest, although an Arab infusion came into the Persian speech, and the religion of the Koran superseded that of the *Avesta*, it was the. Persians, nevertheless, who taught their vanquishers the value of learning, and, by imparting their own literary gifts to the Moslems, created a golden age of letters for Islam in the eighth and ninth centuries (cf. Browne, *Literary History of Persia*, 1. 251–278). The general attitude toward education in the thirteenth century, as well as later, may be gathered from the fact that the celebrated Persian poet and moralist Sa'dī who died in 1291 A.D., devotes to the effects of education a part of one of the chapters (ch. 7) in his well-known work, the *Gulistan* (tr. Eastwick, 2d ed., London, 1880). The existence of Persian ideals to-day regarding education, despite the obstacles in the way of their fulfillment, is illustrated by the presence of two articles (18 and 19) in the supplementary fundamental laws adopted as a part of the national constitution that was framed in 1907. The first of these articles recognized entire freedom in the matter of "the acquisition and study of all sciences, arts, and crafts," except such as may be forbidden by ecclesiastical law; the second exacted that "the foundation of schools at the expense of the government and the nation, and compulsory instruction, must be regulated by the Ministry of Sciences and Arts, and all schools and colleges must be under the supreme control and supervision of that Ministry."

Teacher and Pupil in Antiquity. — From the earliest times the priestly class naturally occupied the foremost position in the matter of teaching. In the *Avesta* a special religious atmosphere is associated with the oft-recurring words for pupil and teacher, which are *aēthrya,* "(priestly) learner" and *aēthrapaiti,* "master of (priestly) learning." The relation between disciple and master was an intimate one, and even a devoted one, as we know from Yasht 10. 116, where a list of sacred ties is given, and this particular bond is rated as "seventyfold" in the scale of a hundred, being surpassed only by that between father-in-law and son-in-law, between two brothers, and between father and son. At this point we may likewise recall the import of the quotation given above from the lost Avestan *Husparam Nask,* bearing upon "the association of priestly instructor and pupil, and their meritoriousness together" (Dk. 8. 37. 4). A recognition of the importance of this bond, moreover, may partly account for traditions ascribing to Zoroaster himself a special teacher or teachers (see Jackson, *Zoroaster*, pp. 29–30, and compare the Avestan fragment given by Darmesteter, *Le Zend-Avesta,* 3. 151 and *S.B.E.* (2 ed.) 4. 371). It is not without interest to add that the name of an ancient teacher appears to be mentioned in a list of sainted names found in the Avestan canon, but we unfortunately know nothing more about him; the passage (Yasht 13. 105) reads, "we worship the guardian spirit of Manthravaka, son of Saimuzhi, the master of (priestly) learning and master of the conference." His son Vahmaedhata is likewise named (Yasht. 13. 115). An original Avestan fragment relating to the duties of a priestly student and his preceptor has been preserved, but the text is in so corrupt a condition that the interpretation of it is not wholly clear (see Erpatistan, 16–18, tr. Darmesteter, *Le Zend-Avesta,* 3. 85, and *S.B.E.* 2 ed., 4. 311–315). The passage in question runs as follows: —

"How long a time, of a year's length, shall a student go to a master of spiritual learning? For a period of three springtides (*i.e.* years) he shall gird himself with the Holy Wisdom. If within a half of this period, when he is reciting, he makes a mistake or leaves out something, he shall go to a second teacher, to a third, even to a fourth. If we see that he knows his text within the half of this period, he must recite it and not leave out anything afterwards" (see also Bartholomae, *Altiranisches Wörterbuch,* col. 132, *s.v. antara,* Strassburg, 1904). In the light of such a passage it is easy to understand the importance attached to religious and moral instruction in Sasanian days as shown by the admonitions of the sage Buzurgmihr, prime-minister to Chosroes I, surnamed Anushirwān the Just (550 A.D.). In his *Pandnamak,* or "Book of Advice," he says: —

> "(36) Education makes man noble, good habits endow him with a virtuous disposition; education is a corrector of man, good deeds the guardian of his soul. (126) A man should spend one out of the three parts of every day and night in getting religious training and in asking sensible questions of pious men. (142) Hence all men, except blind, dumb, and disabled persons, ought to take as much trouble as they can in this world, and to educate themselves in a theological seminary. . . . (143) It is the *duty* of parents to instruct their children, before they attain their fifteenth year, to do many of the good deeds (duly enumerated). For those parents that give a certain amount of education of this kind to their children obtain their recompense from whatsoever good deeds their children do; but those that do not give it draw upon their own heads whatever iniquities their children, devoid of the strength it affords, commit" (see the Pahlavi *Pandnamak-i Vajorg-Mitro,* ed. and tr. by Peshutan Dastur Behramji Sanjana, under the title *Ganjeshayagan,* pp. 11, 21, 25).

From expressions like the above regarding parents, children, and teachers, we can appreciate the claim made in the first century B.C. by the Greek writer Nicolaus Damascenus (fragm. 67) to the effect that "Cyrus was versed in the wisdom of the Magi, in which he was educated; he was instructed in righteousness and truthfulness, and in certain customs of his native country, which exist for prominent men among the Persians." In keeping with this is the statement of Xenophon that "boys attending school pass their time in learning justice" (*Cyrop.* 1. 2. 6). Of a like tenor is the information given by Strabo to the effect that the youths are given "the most virtuous instructors, who interweave useful stories into their narratives, and relate, sometimes with and sometimes without music, the deeds of their gods and celebrated men" (Strabo, 15. 3. 19, Cas. p. 733).

Age of Instruction. — As to the age at which the child's education was to be begun, there appears to have been a natural degree of latitude between the ages of five and seven, the latter being certainly the time when formal instruction was commenced. Up to the age of five, according to Herodotus (1. 136), the boy did not enter his father's presence, but was brought up among the women. The same age is mentioned by Strabo (15. 3. 18, Cas. p. 733), although Valerius Maximus (2. 6) gives seven. The part played by eunuchs as well as the women in the child's bringing up is noted by Plato, *Leges*, 3, 695 A, 694 D, and the Platonic *Alcibiades*, *I*, 121 D. At the Sasanian court, according to Firdausi (tr. Mohl, 5. 341), a special priest was in charge of the youthful Shapur II (309–379 A.D.) until he reached the age of five; and similar care was taken of the precocious Bahram Gur (420–438 A.D.) until the end of his fourth year (*op. cit.*, 5. 400). From five until seven years the child was under the father's tutelage, according to the Pahlavi treatise *Shayast la-Shayast*, 5. 1 (tr. West, *S.B.E.* 5. 290). In general the systematic course of education began when the child was seven years old. This may be inferred from a passage in the *Avesta* (Vd. 15. 45), which says that "the care (*thrāthra*) of the child is for seven years"; as well as from the *Dinkart* (tr. Sanjana, vol. 4, p. 263), which regards the child's power of reasoning as developed at seven, and the child as then responsible to being held accountable by its parents; and a similar idea is found in the *Shayast la-Shayast* (5. 1–2) and elsewhere. (Cf. also Platonic *Alcibiades*, I, 121 D.) This continued from the seventh to the fifteenth year. The age of majority was reached at fifteen when the young man, as did the maiden, took upon himself the religious and other obligations belonging to maturity as recorded in the *Avesta* and in the Pahlavi books (see *Avesta*, Vd. 18. 54; Vd. 14. 15; Yt. 8. 3–14; Ys. 9. 5; H. N. (Yt. 22. 9); Pahlavi, Syls. 5. 25; Zsp. 20. 1; Dk. 7. 10, 17 (tr. West, *S.B.E.* 47. 151, 115); Pandnamak, 143, tr. Sanjana, p. 25). Such was the case with the young prince Ardashir Babagan, the founder of the Sasanian dynasty (cf. Karnamak-i Artakhshir, ed. and tr. Antia, p. 6, Bombay, 1900; also ed. and tr. Darab Sanjana, p. 5, Bombay, 1896); but the exceptionally gifted Bahram Gur, on the other hand, appears to have completed his studies at twelve (see Firdausi, tr. Mohl, 5. 402). These natural differences in point of years may well account for the varying ages given by the classical authors who refer to the education of the Persian princes and nobles, especially their military and physical training. Thus, Xenophon (*Cyrop.* 1. 2. 8) makes the earlier stages of instruction continue to the sixteenth or seventeenth year; Herodotus (1. 136) to the twentieth; and Strabo (15. 3. 18) up to the twenty-fourth year. According to the Platonic *Alcibiades* I, 121 D, the age of fourteen was the time when Persian princes were given out to special royal tutors for advanced training.

Study, Recreation, and Physical Exercise. — Persians, like their descendants to-day, were early risers, and all instruction appears to have begun at an early hour. The *Avesta* (Vd. 18. 23–26) insists upon the virtue of being out of bed by cockcrow; and the Phalavi tractate containing the advice given by Atūrpāt to his son bids the youth, "rise early that you may be able to continue your work" (*Andarj-i Aturpat-i Maraspandan*, 98, ed. and tr. Sanjana, p. 7). The ideal distribution of the day for the Zoroastrian, especially the peasant, is given by Buzurgmihr (Pandnamak, 126 tr. Sanjana, p. 21), and this arrangement assigned one third of every day to religious thought and pious activity, the second third to cultivating the soil, and the remainder to eating, recreation, and sleep. Judging from an Avestan allusion to the duties of a priest (Vd. 18. 5–6), the true cleric was supposed to study day and night (lit. "through the whole night"). In the case of the warrior class and the nobles, early rising was insisted upon, and much of the training consisted in physical exercise. Xenophon (*Cyrop.* 1. 2. 4; 1. 2. 10) related that the boys, like the men, were accustomed to rise early and to appear in the market place "at daybreak." Strabo (15. 3. 18, C. p. 733) adds, "the youths are called to rise before dawn, at the sound of brazen instruments, and assemble in one spot as if for arming themselves, or for the chase; they are arranged in companies of fifty, to each of which one of the king's sons or the son of a satrap is appointed as leader, who runs, followed at command by the others, an appointed distance of thirty or forty stadia. They require them also to give an account of each lesson, when they practice loud speaking, and exercise the breath and lungs." Both Strabo and Xenophon elaborate upon the athletic and martial aspect of the instruction, and no one can overlook the oft-quoted statement of Herodotus (1. 136) that the Persians taught their boys "three things only: to ride, to shoot, and to speak the truth." This was undoubtedly true, because the Persians from the days of Zoroaster onward have been advocates in practice as well as theory of the doctrine *mens sana in corpore sano*; and riding horseback, hunting, archery, javelin throwing, swimming, and polo were regarded not merely as manly sports, but as an essential part of education (see Modi, *Education among the Ancient Iranians*, pp. 1–40).

Scope of Instruction in Early Times. — As already indicated, the general scope of the education in early times was both mental and physical. The former preponderated in priestly education, the latter in the training of the knights and nobles; the training of the third estate, as intimated above, must have been mainly practical in its bearings. Owing to the loss of portions of the *Avesta*, previously referred to, no definite details have been preserved to show the general method of instruction in vogue; but there is undoubtedly much truth in the picture of Persian education drawn by Xenophon (*Cyrop.* 1. 2. 2–13), even if the likeness be an idealized one.

In substance, according to Xenophon, the Persians insisted upon positive precepts and examples in their teaching rather than upon negative commands, and they believed in educating numbers together in common. To this end they had "an assembly place (ἀγορά), called the Free, where the royal palace and other official residences were built," and from which all business was excluded as interfering with the instruction. This "assembly place" (which corresponds to the "Maidan" in modern Persian cities) was divided into four parts, one for boys, one for youths, another for men of age, and still another for those past military service. Over each of the four divisions, which again were subdivided into twelve, a a presiding officer was placed, old men being in charge of the children, and men of maturity directing the youths. The children were taught justice and its administration, obedience, and self-control, together with training in archery, and throwing the javelin. This continued until they reached the age of sixteen or seventeen and entered the class of young men. Upon them now developed the more serious activities, largely military in character, such as standing on guard, practice in the use of weapons, and taking part in the royal hunt. After ten years, or at the age of twenty-five or twenty-six they were accounted as full-grown men.[1]

From the Middle Ages to the Present. — As a direct consequence of the Mohammedan conquest, which occurred in the seventh century A.D. and introduced a different era in Iran's history, Persian education underwent a change in regard to its religious basis, since the Moslem faith was then substituted for Zoroastrianism and has ever since remained as the general creed of Iran. This departure, however, did not interfere with the production of great works on history and science, standard for their day and times. As witness of this truth may be cited the learned annalist Tabari, in the ninth century, the philosopher-physician Ibn Sina, a contemporary of the great Khivan scholar al-Biruni, at the end of the tenth, several renowned authorities among the number of so-called Arab geographers from the tenth to the twelfth century, Omar Khayyam, the algebraist and astronomer-poet, early in the thirteenth, not to mention the long line of Persian poets down to the fifteenth century. Each dynasty had some intellectual product to mark its fame. Noteworthy in regard to the culture he inspired was the reign of Shah Abbas the Great (1587–1629), not only a great ruler and administrator, but also a noble patron of art and of learning, so that the renown of his reign has rarely been surpassed in the history of Persia's glory, and has never since been even approached.

Education unfortunately has been allowed steadily to decline, and although the traditional native instruction is still in the hands of the Moslem priests in schools attached to the mosques, general learning has fallen more and more into decay. Illiteracy is largely the rule to-day among the people outside of the cities, except where the introduction of Western education may have forced a rise of standard in the local system. Chief among the centers that serve as nuclei for Occidental education are the mission institutions at Urumiah, Tabriz, Rasht, Hamadan, Isfahan, Shiraz, Yazd, and Mashad. In Teheran there are a number of madrasahs, or native colleges, and also several institutions on royal foundations, including the Shah's college, in which European instructors are employed as well as native teachers. Best attended, perhaps, among the Christian institutions of Teheran is the American School for Boys (cf. Jackson, *Persia Past and Present*, p. 423; and on mission and native education consult Wilson, *Persian Life and Customs*, pp. 187–188, New York, 1895; Wishard, *Twenty Years in Persia*, pp. 238–242, New York, 1908). A wholesome sign for Persia's future possibilities, if given an opportunity, may be seen in the establishment of a number of newspapers after the Constitution came in, and also in the rapid multiplication of printing presses.

From the historic standpoint it is not without importance to add that the relatively few members of the ancient Zoroastrian faith, numbering now about eleven thousand, who have managed to exist in the face of religious persecution and civic disabilities, are still a potent moral factor in Persia, and have succeeded in keeping up some sort of educational standard in their relatively outcast community. In maintaining this they have been liberally aided by their coreligionists, the

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[1] Twenty-six years was also the age when the Sasanian King Shapur II is regarded as having reached his sovereign dignity according to Firdausi (tr. Mohl, 5. 342). This age corresponds in effect with the twenty-fourth year mentioned by Strabo (15. 3. 18, C. p. 733).

There are passages in the classics which show that the children of noble families were sent to court to enjoy the advantages given by royal education (see Xenophon, *Cyrop.* 8. 6. 10; *Anab.* 1. 9. 3; Procopius, *De Bello Persico*, 1.23), and reference has been made above to the "royal tutors," four in number, appointed respectively as instructors to the princes in religion and kingly duties, truthfulness, self-restraint, and bravery (see Platonic *Alcibiades*, I, 121 D–122 A; and Clemens Alexandrinus, *Pædag.* 1. 7). This statement may be compared with the fact that as a youth the Sasanian king Ardashir Babagan was "instructed in reading, writing, riding, and other arts, and became so proficient that his fame spread all over Fārs" (*Karnamak*, 2. 4–5, ed. and tr. Antia, p. 6; also ed. and tr. Sanjana, p. 5). A further idea of the general regimen employed in the education of princes in Sasanian times may be gathered from the training of Bahram Gur (420–438 A.D.), who was sent to Arabia for his earliest education, and from that of Hurmazd IV, in the sixth century, so far as this portrait by Firdausi in his *Shah Namah* may be regarded as accurate (tr. Mohl, 5. 398–405; 6. 424–430).

Parsis of India, who fled from Iran at the time of the Mohammedan invasion, twelve centuries ago, and established themselves most prosperously in the Bombay Presidency, where they themselves maintain flourishing schools that still give broad instruction on Western lines, and also exercise an influence in keeping up the ancient faith (see Jackson, *Persia*, pp. 379–380, 427; Karaka, *History of the Parsis*, 1. 280–332, London, 1884; Menant, *Les Parsis*, pp. 292–332, Paris, 1898).

Female Education Largely Neglected. — The general neglect of female education throughout the history of Persia has been due largely to the Oriental custom of secluding women. Even in ancient Zoroastrian times, so far as can be gathered from the *Avesta*, a girl's education was practically confined to some religious training and to such simple instruction as would make her a dutiful wife and a good mother of the household (cf. *Avesta, Aiwisruthrima Gah*, 4. 9, and the references given by Sanjana, *Position of Zoroastrian Women*, pp. 15–17, Bombay, 1892). A Pahlavi treatise containing admonitions, the *Andarj-i Aturpat* (ed. and tr. Peshutan Sanjana, p. 2, Bombay, 1885), includes, it is true, an allusion to the education of one's wife together with one's children, self, and countrymen; but the reference is really to religious instruction (as also is noted by Sanjana, *op. cit.*). As to Mohammedan times, evidence may be adduced in proof of the fact that girls received some instruction by the side of boys. This is shown by the romantic story of Laila and Majnun, or the Persian Romeo and Juliet, whose love began while they were still mere school children, according to the poet Nizami in the twelfth century. (See Atkinson, *Laili u Majnun*, tr., p. 5, London, 1836.) Miniatures portraying this supposed schoolroom scene are found in some of the oldest and most beautiful Persian manuscripts of Nizami's poems, and they might well be consulted by students interested in the history of education. In modern times, little has been done thus far for female education in the native communities, but a good deal has been accomplished in the Christian mission schools, where education for girls is universally given, and indications of progress lend encouragement to the cause, especially as the Persians themselves are now promoting it. (Wishard, *op. cit.*, pp. 240–241, and cf. Ella C. Sykes, *Persia and its People*, p. 197.) A. V. W. J.

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PERSONAL EQUATION. — The amount which must be allowed for by a person in making an observation because of the individual character of his reaction time. Originally the term was used by astronomers in connection with the observation of the time of transit of the heavenly bodies. This was done by observing the image of the heavenly body as it crossed parallel lines in the telescopic field, the time being noted simultaneously by counting the beats of a clock. It was found that different observers varied in their results and that the difference was large enough to interfere seriously with the results of the observation. Historically this difficulty led to the reaction time experiment of experimental psychology. E. H. C.

See Experimentation; Individual Differences; Mental Measurements; Tests.

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PERSONALITY. — Personality is closely allied with the conceptions of individuality (*q.v.*) and selfhood. (See Self.) Taken literally, it means the state or quality of being a person. The concept of person arose in connection with Roman law. To be a person was to be a subject of legal rights and responsibilities; that is, of powers and duties capable of enforcement by civil authority. On this view, a corporation or minor civic group, likely a municipality, was a person; slaves were not persons, while minors were persons only vicariously, or through their authorized representatives. As the external traits of this legal view disappeared, an ethical sense developed out of them; a person is the subject of moral rights and duties. Thus Kant said that the moral laws was summed up in the injunctions: Be a Person, and respect others as Persons. A person is an end in and for himself, never a means to anything beyond.

Because of this ethical sense personality is often treated as a "higher" idea than individuality. From another point of view personality is an abstraction compared with individuality. All persons have personality in the same sense; there is nothing distinguishing, nothing concrete about it. Individuality, on the other hand, is always differential; it is something that *specifically* characterizes each self. Individuality expresses what one uniquely *is;* personality expresses what one *has* — a property that one may acquire. In this sense, individuality is deeper than personality. In earlier days children were classed with slaves as intermediate links between things and persons, save that they differed from slaves in the potentiality of personality. This conception of childhood was embodied in methods of discipline, punishment, and instruction, it being assumed that children had no rights of their own. With the development of the democratic idea, rights of personality were extended to children, and methods of education have accordingly undergone considerable reconstruction. No consistent theory upon this point has, however, as yet, been worked out in practice. J. D.

PERSONALITY OF THE TEACHER. — See PERSONALITY; TEACHING AS A PROFESSION.

PERSPECTIVE. — See ART, METHODS OF TEACHING.

PERTUSSIS. — See WHOOPING COUGH.

PERU, EDUCATION IN. — Peru is a republic with an area of 700,000 square miles, including disputed territory, and a population of 4,600,000. The population of Peru is composed of whites, chiefly the descendants of the Spaniards, mestizos or a mixture of Spanish and Indian blood, Indians, Negroes, and a few Orientals. There is almost every degree of civilization, from the barbarous tribes of the montaña to the highly cultured people of Lima, the capital of the Republic, and other large centers. The population for the most part is grouped in centers, but these centers are widely distributed, and means of communication are not good. Geographically, Peru is divided into three sections — *la costa, la sierra,* and *la montaña.* The first is a narrow strip extending along the Pacific coast for a distance of some 1200 miles. It is generally arid; but it is pierced by sixty mountain streams which during the ages have left along their banks rich deposits of alluvium now covering an area of 2000 square miles. The *sierra* is the mountainous area, including many fertile valleys, lying between the coast and the *montaña,* which comprises about two thirds of the total area of the country. Only a small portion of it is inhabited. The political divisions of the country are as follows: nineteen departments and three provinces with the organization of a department, 103 provinces, nearly 800 districts, and a large number of subdistricts. The political organization is governed by the constitution, as formed in 1860. The authorities in immediate control of the different subdivisions of the state are, prefect, subprefect, governor, and lieutenant-governor, respectively. These form a political hierarchy responsible to the President of the Republic and his cabinet, in whom all administrative authority is centralized. The Roman Catholic Church is the only one recognized by law, but as a rule other denominations are not molested.

Historical. — The Spanish adventurers whose conquest of Peru with its ruthless spoliation of the Incas forms one of the most thrilling episodes in the history of the Western continent, were accompanied in this region, as elsewhere, by church dignitaries and prelates who established the authority and ceremonial of the Roman Catholic Church as fast as permanent settlements were effected, organized schools, and upon the ruins of the ancient civilization built up a new aristocracy, tyrannical, luxurious, but, in a sense, cultured. While this alien power was strengthening itself, a few priests with true missionary zeal labored to convert the humble natives, and opened mission schools which imparted to them a curious mixture of letters and religious dogma. The Jesuits controlled many colleges in the colony from the sixteenth until their expulsion in the eighteenth century. The University of San Marcos, the oldest in the Western continent, was established in Lima under Dominican auspices, by Papal Bull of 1571 and confirmed by royal decree the following year; that of Cuzco in like manner in 1692. Around these institutions grew up preparatory schools, or colleges, intended mainly for the training of religious novitiates and teachers. The natives that came into direct contact with the Spaniards gradually assumed their social ideas and mental habits. Thus modern Peru has inherited from the colonial period the framework of a centralized scholastic system and the culture ideals of an aristocratic order.

In 1821 Peru declared its independence, and in the organization of the republican government due regard was paid to education. In 1822 a normal school was established in Lima on the Lancasterian plan, and in 1823 a central office of education was created. This early agitation had, however, little effect outside of Lima, where in 1833 four schools were established for each sex. Like the earlier normal school they showed the influence of the Lancasterian system. The course of study comprised reading, writing, arithmetic, grammar, and religion, with instruction in sewing for the girls. For half a century the history of elementary education in the Republic is little more than a record of official orders and the increase of free schools in the capital. During this period secondary education was represented by the colleges in which pupils were prepared for admission to the universities. The continued interest in higher education was shown by the founding of the universities of Trujillo and Arequipa in 1824 and 1835, respectively. In 1876, under the leadership of President Manuel Pardo, a reform movement was started; but its progress was interrupted by the destructive war between Chile and Peru which raged from 1879 to

1884. The century was near its close before popular education again engaged the attention of the government.

Present System. — In 1896 a special commission, the *Junta Reformadora*, was appointed to deal with the educational problem of the Republic. The outcome of the work of the commission was the law of 1901, which forms the basis of the present system of public instruction. The law provided for a Minister of Public Instruction, Justice, and Worship; in respect to his educational functions he was to be assisted by a Director-General and a Superior Council. The reaction against local independence, which is indicated by the law of 1901, was completed as regards secondary and higher education by an order of September, 1905, transferring their control from the Superior Council to the Minister, and as regards primary education, by the law of December 5, 1905, which bore the signature of José Pardo, who had succeeded his father as President. By this law the control of primary education was centralized in the Minister of Public Instruction, and the inspection of primary schools intrusted to district inspectors subordinate to provincial inspectors, the latter being directly responsible to the Minister.

In 1907 the National Council of Education was reorganized, its membership being fixed as follows: the Minister as presiding officer, the Director-General of Public Education, the Rector of the University of San Carlos at Lima, a delegate elected by each of the faculties of this university, the Director of the National College of Guadaloupe, Lima, the director of the men's Normal School, the three directors of the schools of Engineering, Agriculture, and Arts and Trades, respectively, and a delegate named by the private schools. This Council, which works through committees, has the right of initiative in all school matters. As regards primary education, the most important feature of the administrative system is the inspectorate. In accordance with the provisions of the law of December, 1905, a paid inspector of primary schools was placed in each of the 101 provinces of the Republic, while in nearly all the 800 civil districts, unpaid inspectors, subordinate to the former, were appointed.

As the work of organizing public schools went on, the need of expert guidance became more and more evident, and at the beginning of the present administration measures were taken to supply this demand. The newly appointed Minister of Public Instruction, Dr. Manuel V. Villarán, was a man of exceptional ability, familiar with educational movements in the leading countries of the world, and desirous of introducing into Peru the main features of the system of school administration in the United States. At the suggestion of the Minister, the Peruvian government, in May, 1909, secured from the United States a small number of professionally trained men, for appointment as inspectors of primary instruction, a specialist in commercial education to organize the work in the national college of secondary instruction in Lima, and a specialist in educational administration, to act as adviser to the Minister. Soon after these appointments were made, a change of ministers occurred, but the educational work was not interrupted. In February, 1910, a special commission was appointed under the presidency of Dr. Villarán, for the purpose of preparing a new education law and perfecting the administrative system on the lines already laid down. As indicated by the crude draft of the bill on which the commission is working, they will endeavor to secure, as first essentials, provision for a permanent force of trained teachers, for an inspection corps of high qualifications, and a permanent school fund. The importance of local activity and responsibility in a system of public education is recognized by the commission; but at present these conditions cannot be secured in Peru.

Primary Schools. — Primary instruction is divided into elementary, covering two years, and higher primary, which covers a period of three years. The elementary period is legally obligatory for all children. The higher primary or optional course is provided only in central schools (*centros escolares*) which exist in all the capitals of provinces and in some of the other more important towns. The regulation provides for one school in all plantations, mining settlements, and villages of less than 200 inhabitants; those of more than 200 are entitled to a central school. Unfortunately the funds available are not sufficient to carry out this purpose. The regulations provide for infant schools, or kindergartens, in the capitals of provinces, but so far they have been organized in the larger cities only. In general the pupils are separated according to sex; but mixed schools exist for economic reasons. On account of the prejudices of parents, a mixed school is very rarely coeducational; in most communities the sex that happens to predominate will attend, the other remaining at home, this generally falling to the lot of the girls. Even when both sexes attend, they are seated in different rooms and are instructed separately. Although the school age is from six to twelve for girls and six to fourteen for boys, mixed schools cannot legally receive boys over ten years of age or girls of more than twelve; however, in many "mixed schools" where one sex is crowded out, there are pupils over fifteen years of age. The principals of boys' schools are always men, though women teachers are frequently employed as assistants; only women may have charge of or teach in mixed schools. Outside of the larger cities not much interest has been awakened in the education of girls.

Course of Study. — The course of study for the elementary division comprises, besides the three essential branches, nature study and religion (catechism), notions of geography and history of Peru.

The second division continues these subjects and adds Spanish, physics, chemistry, natural history, manual training with inventive geometry and drawing, music, physical exercises and hygiene, notions of agriculture and arboriculture; the moral instruction consists of the Christian dogma and sacred history, and social duties. In the fourth year horticulture and drawing from nature are added to the preceding subjects, and the manual training begins to differentiate according to the sex of pupils, the girls taking up weaving, sewing, embroidering, and laundering, while the boys have elementary work in carpentering, blacksmithing, tailoring, shoemaking, and printing, according to the trades most in demand in the community. In the fifth year, civic education takes the place of moral and religious instruction. It is an overcrowded program and is seldom fully carried out.

Schoolhouses and Supplies. — Public education is not only compulsory, but free; the government provides the schoolhouse and furniture, and, also, free of cost to the pupils of the first two years (the compulsory period), textbooks, pencils, tablets, pens, etc. This liberality, together with the aim of the government to provide a home for each teacher holding a permanent appointment, a gradual increase of salary and a pension after twenty years of service, indicates something of the scope of the reforms recommended by President Pardo in 1905. Owing to the lean years through which the government is now passing, it has not been possible to realize all these purposes.

Teachers, Certificates, Salaries, etc. — Teachers belong to one of three classes according to the manner of appointment, that is, by the provincial inspector, by the prefect of the department from a list of three proposed by such inspectors, or by the minister. The first class of appointment is temporary, the teacher being subject to removal or transfer at the will of the inspector; only the minister can remove or transfer a teacher of the second class; those of the third class receive their appointment as the result of a competitive examination, or on the basis of successful experience, and hold their position for life or until they are retired, unless removed for flagrant misconduct.

There are three grades of teachers' certificates which are secured by examinations conducted by the departmental inspectors. Under present conditions the examinations are of little value, but with the improvements contemplated it is believed they will offer the means of obtaining competent teachers, provided fair salaries are paid. At present these are very low, the average annual salary not exceeding $240. The few graduates from the normal school for men command $600 a year; graduates from the normal school for women, from $270 to $480. The cost of living is about the same as in the United States. According to the law of 1905, teachers who hold their schools by permanent appointment, after serving twenty years may be retired on half pay, provided that during that period they have contributed to the fund 4 per cent of their salary, which must be at least $25 a month.

For the training of teachers, there are three normal schools: one for each sex in Lima and one for women in Arequipa. These schools have been staffed in the main with foreign teachers and are doing excellent work. They are, however, quite inadequate to supply the annual demand for new teachers, as they do not send out more than forty graduates a year. Consequently the commission advises the maintenance of teachers' institutes in all the departments, as a means of giving professional training to candidates who have met the scholastic requirements for certificates. There are now about 3000 teachers and principals in the public schools, of whom not more than 160 have had a normal course or other professional training, and less than 40 per cent have secured any certificate whatever.

Condition of School Buildings. — The provision of sufficient school buildings suited to the work imposes a heavy tax upon the school income. In 1909 there were nearly 2000 buildings in use, of which 550, valued at $410,199, belonged to the government. Many of these buildings had been used as prisons or barracks and had been converted into schoolhouses without much alteration. The new buildings constructed in Lima and Callao are models in arrangement and sanitary conditions; but under the straitened financial conditions, progress in this respect has ceased for the present.

Signs of Progress. — In spite of the difficulties of the situation and the many deficiencies to be overcome, there are gratifying signs of progress accomplished since 1905. This is more apparent in the awakened interest in the cause and the aroused ambition of the teachers than in measurable results. The following statistics, however, show advance in important particulars.

	1906	1909
Number of schools	1425	2159
Number of teachers	1557	2909
Number of enrolled pupils	85,000	153,901
Average attendance	73,086	84,408
Number of pupils completing two-year period	8375	11,177
Number of pupils completing five-year course	278	511

Secondary Education. — The secondary schools of Peru (*colegios*) offer a course of study continuous with that of the primary schools and leading up to the universities. The principal or director of each college reports directly to the Minister of Public Instruction as to the state of his institution. For each college there is a financial committee which prepares the estimates of annual expenditure and exercises a measure of supervision over the disbursement of the funds appropriated. The professors are responsible only for their class instruction. A few of the colleges in Lima and Callao have a permanent staff of foreign teachers and are doing good work; but the prevalent custom of engaging local professional men, lawyers and doctors, to give instruction precludes satisfactory results.

The course of study which is uniform for all the colleges covers four years, and comprises for the first two years the following subjects: Spanish, English or French, general history, geography, arithmetic, science, religion, penmanship, drawing, and music. The science subject for the first year is zoölogy; for the second, botany. In the third year the science course is extended to include mineralogy and geology, physics and chemistry with laboratory work. The fourth year, philosophy and civics are added, time for these being gained by reducing the other subjects. Pupils enter the colleges at twelve years of age, coming alike from the public primary schools or from preparatory sections of the secondary schools. The overcrowded course is intended for four years, which is evidently too brief a time for the mastery of the severer studies. The total number of colleges is twenty-seven, of which three situated respectively at Cuzco, Trujillo and Ayucucho are for girls only. The others are also open to girls, but few ever seek admission to them on account of the prejudice against coeducation. The number of pupils attending the colleges in September, 1910, was 2787, of whom 1106 were in the primary departments.

Sources of Support. — The sources of support for the secondary schools are government and departmental subsidies, income from properties, and tuition fees. The last-named source yields about 25 per cent of the entire income, which in 1910 amounted to $340,000, or an average of $12,592 for each college. The repeated endeavors to establish a permanent school fund have been thus far unsuccessful; the organic law of 1901 provides that 5 per cent of the national revenues, 30 per cent of the departmental revenues, and the proceeds of the duties on liquors shall be devoted to the maintenance of primary schools. But the amounts thus realized have not been sufficient for the service. The total receipts for the successive years 1906 to 1909 were as follows: —

		Per Capita of Enrollment
1906	$1,115,785	$7.52
1907	1,158,590	7.42
1908	1,309,090	8.06
1909	1,400,000	9.09

In estimating the relative value of the per capita expenses it must be considered that the enrollment in public schools in 1909 was only 3 per cent of the population, whereas the normal proportion would be at least 12 per cent.

The Universities. — The secondary schools prepare students for admission to the universities. The latter are four in number: San Marcos at Lima, having six faculties; San Antonio Abad at Cuzco, and San Augustin at Arequipa, four faculties each; San Tomas and Santa Rosa at Trujillo, the faculties of letters and law. The complete scheme of higher education is illustrated by the distribution of studies at the major university of San Marcos, Lima, which in 1910 was as follows: —

Faculty	Number of Students
Philosophy and Letters	136
Mathematics and Natural Sciences	229
Political and Administrative Sciences	24
Theology	4
Law	140
Medicine	172
Total	705

The total registration in the four universities in 1910 was 1154 students.

For admission to the faculties of philosophy and letters, and of mathematical and natural sciences, a certificate showing that the candidate has completed the regular four years' course of secondary instruction is required; for admission to the faculties of jurisprudence and of political and administrative sciences, a certificate secured by two years' work in the faculty of letters; for admission to the faculty of medicine, the completion of two years' work in the faculty of sciences.

At the completion of five years' work in the faculty of medicine, of three years in the faculty of law, and of two years in the other faculties, the degree of A.B. is awarded. The completion of the full course, *i.e.* seven years in medicine, five in law and theology, and four in the remaining faculties, entitles the student to the degree of Doctor in the respective faculty.

Although the universities are under the general direction of the Minister of Public Instruction, they have a large measure of independence. The internal affairs of each are nominally regulated by the Rector and University Council, the latter consisting of representatives of the several faculties. In fact, these authorities have chiefly to do with the fiscal affairs of the institutions, and the professors are practically independent in their work. The reorganization of the universities with a view to promoting internal unity and forceful administration is one of the most important problems before the education commission. On the scholastic side there is need of closer adjustment with the practical interests of the country. It is urged that a strong department of education should be created in the University of Lima, as a means of preparing students for the higher positions in the public school service. Already plans have been made for developing a commercial department in the University of Cuzco. This is due to the work of Dr. Alfred Giescke, a graduate of the University of Pennsylvania, who was engaged to establish a commercial department in the college of Guadalupe, Lima, and who was subsequently appointed president of the university named.

The School of Agriculture and the School of Engineering together registered 200 students in 1910, which raises the total in higher institutions to 1354. The annual expenditure for higher education, universities, and technical schools, both included, is about, $200,000. While Peru is looking to foreign countries, and in particular to the United States, for expert guidance in the effort to extend popular education and the higher order of technical training, there is an evident purpose to maintain the standards of professional training that are already well established. This purpose is indicated by the decree requiring foreigners who seek to practice either medicine or dentistry in that country to present the diplomas of their respective universities and also to submit to the same examinations as native applicants for professional sanctions. Even in the proposed reorganization of public instruction, care is taken to conserve the administrative system which experience has shown to be best adapted to present conditions.

H. E. B. and A. T. S.

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PERUGIA, UNIVERSITY OF. — See Italy, Education in.

PERWICK, MRS. — The proprietress of an English girls' boarding school, one of the earliest of which we have any notice. This school, in 1643, was kept in the Black and White House, in Church Street, Hackney, London. The details about the school are given in a biography of Mrs. Perwick's daughter Susanne (1636–1661), written by John Bachiler. The girls (of whom Mrs. Perwick had about eight hundred) were taught principally by masters, thus continuing for schools the custom which had obtained in Tudor times, of employing a man as private tutor for the girls of the family, *e.g.* Roger Ascham for Princess Elizabeth, Richard Hyde for Sir Thomas More's daughters, and Christopher for Margaret Roper's daughters. Thus ten masters' names are given as teaching at Mrs. Perwick's school. Bachiler's book (published in 1643) advocates the " public " education of girls and argues that schools do not necessarily corrupt manners and morals. The subjects incidentally named as taught in the school are religious knowledge, reading, especially scripture, and music. In the latter the " grounds " were studied; and of instruments, the treble viol, the lyre, the harpsichord and the organ were all taught, and vocal music was cultivated. Dancing, including gesture and bearing, was an important object. The handwork taught and practiced included the needle, and work " by silver, silks, straws, glass, wax, gums, etc." Penmanship seems to have included accountancy. Housewifery and cooking were not neglected. On Sundays, the girls went to church close-covered with the hood. On return, they wrote out the sermon, made notes, and " reënforced daily prayers." F. W.

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PESSIMISM. — In popular usage the disposition to look on the dark side of things; as a systematic philosophy, the theory that existence and life are radically evil, so evil that the only remedy is the negation of the " will to live," the exact antithesis of optimism (*q.v.*) as a philosophy. In considerable part, the motivation of pessimistic systems has resided in the superficial and complacent view of evil as an incident which contributes to the perfection of the whole taken by optimistic systems. Leibnitz's formula that this world is the best of all possible worlds obviously lends itself readily to an extremely pessimistic interpretation. A certain pessimistic tone concerning the world as it *now* exists has also been a marked feature of the most serious and influential religions, such as Buddhism (*q.v.*) and Christianity. In general, nineteenth-century thought reacted in this as in other respects against the characteristic eighteenth-century thought, which had been optimistic. The latter held to the doctrine of natural harmony working inevitably for the increase of perfection and happiness; the former dwelt upon the existence of discord, struggle, and competition. The Darwinian idea of the omnipresence of the struggle for existence accentuated this tendency. While the pessimistic spirit found its most adequate expression in literature, especially poetry, it also found systematic metaphysical embodiment, notably in Schopenhauer and Von Hartmann. While systematic pessimism is too contrary to the needs of living beings to secure for itself many consistent adherents, it has made impossible the older type of optimism, and has been a leading factor in bringing about the transformation of optimism into meliorism. The latter holds to the reality of evil as a genuine fact, but emphasizes the possibility, through good will and intelligently directed effort, of a progressive amelioration. It is essentially a doctrine of progress. J. D.

See OPTIMISM; SCHOPENHAUER.

PESTALOZZI, JOHANN HEINRICH (1746-1827). — One of the world's greatest pioneer educationists, and a Swiss patriot who did much for his country by his work for social regeneration through educational reform.

Life and Career. — Born in Zürich, he lost his father when five years old, and was brought up almost wholly under the influence of his mother and a devoted servant. As a boy he was delicate, shy, awkward, dreamy, and unpractical. He passed through the elementary, preparatory, and Latin schools, and finished his education at the Public College of Zürich. In none of these did he distinguish himself as a student, owing to his want of accuracy and thoroughness in details, but he showed real ability and excelled in his grasp and understanding of principles. While still a youth he attached himself to the Swiss reform party — the country being at that time in the throes of social and political revolution — and was greatly influenced by two of his professors, Bodmer and Breitinger (prominent thinkers and literary men); the writings of Rousseau; and the friendship of Lavater, Füssli, and Bluntschli. He joined the Helvetian Society, took part in its debates and social activities, and wrote for its journal, *Der Erinnerer*, articles criticizing the public corruptions of the time and urging social and educational reforms. Touched by the poverty and ignorance of the poor, which he saw in the parish of his grandfather, Pastor Hongg, he resolved to prepare himself for pastoral work, but changed his mind after his first attempt to conduct a service. Then he began to study law, with a view to help his country through local and national affairs. Overwork in this, and shock at the sudden death of his friend Bluntschli, brought on a serious illness. His doctor advised him to give up study and live an open-air life. The writings of Rousseau and the Physiocrats had already led him, with other enthusiastic students, to make amateur experiments in the return to the life of nature; and he was quite willing to take to the simple life. So he burnt all his books, vowing never to read one again, and turned farmer in 1767. Two years later he bought a farm in the canton of Aargau, and took to himself a wife. His young and beautiful bride, Anna Schulthess, proved a gifted and devoted wife, a helpmeet for him through all his sufferings, failures, and successes.

Neuhof. — As a farmer his brilliant but erratic gifts were his downfall. After seven years of struggle he found himself in desperate straits as a man of affairs. But as a man of ideas he had begun to find himself in these same seven years of failure. At Neuhof, as he called his farm, was born to him a son whose early education he himself undertook, and thereby began his educational discoveries. His observations, experiments, and experiences in the education of his little boy "Jacobli," proved a pioneer effort in practical child study, or experimental pedagogy, and was the beginning of his formulation of the practical principles of education according to nature. Basing his attempts on the theories of Rousseau, he was led to modify and correct many of this great writer's views. From the beginning of 1774, when his son was three and a half years old, he kept a regular record of his work with him in *A Father's Journal*, and therein are to be found all the great root principles of his final views on education; in particular, the principles of intuition and sense perception as the only real bases of true education. He had also begun to develop ideas on the education of the children of the poor from the industrial standpoint. The barrenness of the farm and his unsuccessful management led him to set up cotton spinning as a means of livelihood in 1774. To do the light work connected with this, he employed the children of the very poor, so that they might be rescued from mendicancy, enabled to earn their bread, and pay something towards their education. Workhouse children were sent to farmers in those days, and were often turned out to beg their bread. Pestalozzi's central idea was that the employer should be responsible for the education of young employees. But in cotton spinning also he failed, from the practical point of view, and was soon absolutely at the end of his financial resources.

But just at this time he had the good fortune to be introduced to Iselin (*q.v.*) at a meeting of the Helvetian Society. Pestalozzi discussed his view on industrial education with Iselin, who encouraged him, and advised a public appeal for support. This was drawn up in December, 1775, and published in Iselin's Journal (*Die Ephemeriden der Menschheit*) in 1776, as an appeal to "The Friends of Humanity" to support the Neuhof industrial school. The appeal was successful, and Pestalozzi was able to add to the twenty children already in his employ. He undertook to teach them to read, write, and calculate. The boys were to be taught all the practical processes of small farming, so far as this could be done at Neuhof; the girls, gardening, domestic work, and needlework, and all were to do cotton spinning. All were to receive such a religious education as would develop in them pure and tender hearts. The subscribers were to receive reports on the work of the institution. The appeal, two reports, and three letters, which all appeared in *Die Ephemeriden*, and another report on the school published as a pamphlet, set forth Pestalozzi's views on *The Education of Poor Country Children* (1777–1778). There were seventeen boys and twenty girls in the school in 1778. Two years later the whole thing collapsed because of financial difficulties due to Pestalozzi's business incapacity. He and his family were ruined, and became poorer than some of those whose sufferings they had learned to understand, and for whom they had sacrificed themselves.

Literary Activity. — In this dire distress his pen was his only means of support. Encouraged by Iselin and Füssli, he began to write: first a series of short maxims on education, morals, and religion, for Iselin's journal, under the title *A Hermit's Evening Hours;* then a prize essay (dividing first prize with another writer) on *Sumptuary Laws;* and soon after a skit on the clothing of a town watchman, during 1780. The last of these was seen by Füssli's brother (the painter), and caused him to suggest that Pestalozzi should write a story. The result was *Leonard and Gertrude* (1781), a romance of rural life, based on his own experience and knowledge of the lives of the poor, and expressing his views on social reform and regeneration through home and school education and democratic local government. It revealed Pestalozzi as a writer of original and exalted powers, met with great and immediate success, and has become a world's classic. He calls it "a book for the people," and wrote four other parts of it in 1783, 1785, 1787, and 1826, respectively. Feeling that the main purpose of the book had been missed by its readers, he published another to point its morals. This was *Christopher and Eliza* (1782), "my second book for the people," in which a peasant family read and discuss *Leonard and Gertrude.* It was not a success. During 1782 he conducted a weekly paper, *The Swiss Journal,* in which he wrote on education, politics, and morals. It only lasted a year. In 1797 he made a third attempt to explain, by parables or fables, his *Leonard and Gertrude* in a book entitled *Figures for my ABC Book.* From 1783 to 1797 he published several political essays. At the suggestion of Fichte (*q.v.*) he endeavored to work out the philosophical bases of his views on education, and after three years of laborious study published his *Investigations into the Course of Nature in the Development of the Human Race* (1797).

Stanz. — On the 9th of September, 1798, occurred the battle and massacre at Stanz, one result of which was that a poorhouse had to be provided to shelter the homeless orphans of the neighborhood. Pestalozzi was asked to take charge of this, and eagerly consented. No conditions could have been more unfavorable for testing his theories, — half-restored ruins for a school building; himself the only teacher; a peasant and her young daughter the only domestic servants for a household of eighty; distrusted as a heretic by the inhabitants; without sufficient furniture or school apparatus; and with many of his pupils very dirty, degraded, and diseased, he was overwhelmed with worry and work. But he was filled with a great hope and a great zeal; he would realize the picture of Gertrude's school at Bonnal. Physical education in the form of play, drill, and industrial work alternated with mental and moral culture through reading, writing, arithmetic, and living the good life. Simultaneous repetition was much used in lessons, and older and more advanced children put to teach others. No books were used, nor was there any definite syllabus or time-table. Yet, in spite of all defects, there were splendid successes, and all who saw the work were amazed and delighted. But the school which received its first pupils on the 4th of January, 1799, was closed at the beginning of June, in the same year, so that the building might be used as a military hospital. Pestalozzi retired to the mountains to recruit his seriously impaired health. After a few weeks' rest — which probably saved his life — he returned to Stanz, anxious to resume his work; but meantime other arrangements had been made.

Burgdorf. — Through the influence of Minister Stapfer (Arts and Sciences) he obtained a post in a school in Burgdorf, under a headmaster who was a working shoemaker. He was given a small salary, and lodging in the castle, on condition that "his work benefited the pupils and furthered the perfecting of his method." Some parents, urged on by the schoolmaster, raised an outcry against experiments being made on their children, and Pestalozzi was transferred to an infants' school, with twenty-five pupils from five to eight years old (boys and girls) under a mistress.

Here he had full liberty and directed his experiments to the discovery of the psychological laws and the simplest methods of teaching. He began the plan of teaching through language, number, and form, and was remarkably successful, though he still used simultaneous repetition and had no time-table. And now fortune was kind to him: — he met Fischer, the head of the training college for teachers in the castle of Burgdorf, who was formerly professor of philosophy and pedagogy at the Bern University, and a disciple of Salzmann (*q.v.*) the Philanthropinist. They became friends, and Fischer, later on, introduced Krüsi (*q.v.*) to him. When Fischer died rather suddenly in May, 1800, the castle was handed over to Pestalozzi and Krüsi, who proposed to carry on a training college, a secondary boarding school, an elementary day school, and an orphan asylum; and to combine with their work experiments in education and the publishing of books thereon. In a short time the staff was increased by the arrival of Buss, Tobler, and Niederer (*q.v.*), who became and remained loyal, devoted, and self-sacrificing colleagues, and together with Krüsi introduced method, order, and thoroughness into Pestalozzi's plans. Under them Burgdorf was the center of educational experiments, investigations, and training such as the world had not hitherto seen. High and low came from all parts to admire and to learn. Here Pestalozzi published (1801) *How Gertrude teaches her Children,* in which he expounded his principles and methods of education, so that — as he thought — the psychology and practice were reduced to such simple terms that every mother could understand and use them. All who wish to understand education according to Pestalozzi must read this book. It makes and marks an epoch in education and is the source of many of the best and most modern views. For the guidance of parents and teachers, Pestalozzi and his staff published the following elementary books during 1803: *The Mother's Book*; *The A B C of Intuition, or the Intuitive Teaching of Form Relations* (in two parts); and *The Intuitive Teaching of Number Relations.* These books explain his underlying ideas in teaching speech, form, and number, and give detailed examples of lessons in these subjects. They are intended to be used only for young beginners. By such means Pestalozzi worked out his ideas and spread them abroad. He achieved fame and success, and did his very best work, at Burgdorf.

Yverdun. — In July, 1804, Pestalozzi had to vacate the castle, which was required for governmental offices. An arrangement was made for the institution to be housed at Münchenbuchsee, near to Fellenberg's Institution at Hofwyl; and the practical direction of it was committed to Fellenberg (*q.v.*), while Pestalozzi continued to be the proprietor. Unhappy differences arose between them, and, in July, 1805, the agreement was canceled and Pestalozzi's Institution was removed to the castle at Yverdun, where it continued till its end on March 2d, 1825. The first five years of this time were years of brilliant successes in which the institution became world famous. After this came private and public misunderstandings, strife, humiliation, and decay; and the less said of these the better. But the worse matters became the more Pestalozzi returned to his original and constant idea of the education of the poor. He started the Clindy Poor School (1818); and at the moment of final failure his one great wish (unfulfilled) was to transport it to Neuhof. At Yverdun the method was applied to older pupils from many countries; to more advanced stages of school subjects, including classics; and to the education of girls in a separate school. Pestalozzi's chief writings from 1805 to 1827 were: the *Weekly for Human Education* (1807–1821), in which appeared his *Lenzburg Address*; the *Discourse on the Idea of Elementary Education* (1809), a *Report on the Condition and Organization of the Yverdun establishment* (1808); Nägeli's articles on the teaching of singing, etc.; *Views and Experiences relating to the Idea of Elementary Education* (1807); *Addresses to the whole school* (1808–1813); the *Swansong* (1813), the first part of which is *On Education according to Nature;* and *Letters on Early Education* (1818), written to an Englishman. His political enthusiasm had endured and he wrote important political pamphlets. The closing year of his life found him faithful to his three great purposes: as friend of the poor he was engaged in reëstablishing his industrial school at Neuhof; as political reformer he wrote an address *On Fatherland and Education,* for the Schinznach Helvetian Society, of which he had been elected president; and as educationist he wrote a paper entitled *An Attempt at a Sketch of the Essence of the Idea of Elementary Education,* for a meeting of the Brugg Society for the Promotion of Education, at which he was present.

Educational Theories. — Though Pestalozzi never wrote a clear, systematic, and complete account of his theories, his writings and work give the material for a definite outline of his views. Fischer, Chavannes, Jullien, Niederer, Morf, Mayo, Krüsi (junior), and Payne have all given such outlines. The foundation of his doctrine is that all human development and power spring from possibilities native to the human being, *i.e.* "the growth of man is God's work, and the result of universal laws conferred on his nature"; that "the moral, spiritual, and artistic capabilities of our nature must grow out of themselves"; that "a man's powers are all part of an organic whole"; that "nature develops all the human faculties by practice, and their growth depends upon exercise"; and that man's development is itself organic, *i.e.* "the individual and separate organs of his being form themselves gradually into unison." Hence, the function of the educator is to assist "nature's march of development" so as to secure a natural, symmetrical, and harmonious progress; thus "improving the tendencies and powers of humanity." These fundamental truths lead to the following general principles: (1) *Education must be essentially religious,* since man has a divine origin and end. (2) *Education must develop man as a whole.* It must draw out all his moral, mental, and physical powers, in a balanced and harmonious progress at every stage; "the development of human nature, the harmonious cultivation of its powers and talents, and the promotion of manliness of life: this is the aim of instruction." We must develop the powers of "the head, the hand, and the heart," concurrently and according to the nature of each. (3) *Education must guide and stimulate self-activity.* "The only means of development our powers possess is their use." The educator must do as little as possible; his work consists "in a continual benevolent superintendence — giving a helping hand to the instinctive efforts after self-development." (4) *All education must be based upon intuition and exercise.* This is Pestalozzi's great theory of *Anschauung* (*q.v.*), by which he means "the immediate and direct impression produced by the world on our inner and outer senses, *i.e.* the impressions of the moral world on our moral sense and the physical universe on our bodily senses." Sense experiences need to be elaborated and organized through observation, and the learner must, therefore, acquire a true art of observation, *i.e.* the thorough and exact grouping, separating, and combining of objects. (5) *Education must observe a right graduation and progression in development,* for "there is in nature an order and march of development, and if you disturb or interfere with it you make the powers of the mind weak, unstable, and unbalanced." "Each child should be taught that which he has to learn at the time his nature calls for it, for this is proof that his sensibility and power are ready for it." The child repeats the history of race in its development. Each stage of development must grow out of the preceding and into the following stage by scarcely perceptible additions. Mind and body are one, and, therefore, practical power must develop with knowledge, and practical skill with insight. Both must proceed from the known to the unknown; the simple to the complex; and the near to the remote; and always in relation to the experiences of real life. (6) *Education must foster the growth of knowledge through the development of ideas.* From mere vague impressions the mind must evolve values and meanings. From "a swimming sea of confused sense-impressions" some one thing stands out as a separate something, *i.e.* the person has a *distinct* idea of it. Next it may be observed more fully and in detail, so that the person can describe it accurately, *i.e.*, he has a *clear* idea of it. By further analysis and by combining and comparing it with other objects, he is able to define it, or state its essential qualities so as to mark it off from all other objects; *i.e.* he has a *definite* idea of it. This progress of ideas is obtained through getting to know how many, and how many kinds, of objects appear in consciousness; investigating what their form and outlines are; and abstractly thinking about these by the help of words, *i.e.* through number, form, and language.

From the foregoing six principles follow certain practical rules for the educative process. (1) *An all-round training must be given.* (2) *All possible liberty must be allowed to the learner.* "The nature of the child must determine all the details of his education." Enlightened affection and confidence, and geniality, must exist between teacher and pupils. (3) *Work is more important than words.* "Work in general is the surest of all exercises for the attention," and "man is much more truly educated through that which he does than through that which he learns." Knowledge without practical power, or insight without the ability to apply it, is a "fearful lot for a human being." Words may "not only destroy the powers of attention to the impressions of nature, but mar the very susceptibility toward them." Our activities are "the sense-foundation of our virtues." (4) *The method of learning must primarily be analytic, i.e.* based upon the analysis of experience. "We put our children on the road which the discoverer of the subject himself took, and had to take." A pupil at Yverdun writes "we are made to invent geometry, the masters contenting themselves with pointing out the end to attain; and putting us on the road to it." (5) *Realities must come before symbolism in learning.* "Elementary education must aim at establishing connections between the child and the realities of his actual life." Sense-perception is the one sure basis of thought and judgment which are developed through language, and therefore this order must be observed, whilst maintaining harmony between experience, thought, and language. Hence, the great importance of object lessons and science. We "get knowledge by our own investigation, not by endless talk about the results of art and science." "I desire to make the effect of words and talk on the mind of little account, and to secure that dominating influence proper to the actual impressions of physical objects." (6) *Organization and correlation are necessary.* This applies to the relations between mind and body, the nature of the child and of knowledge, and the pupil and school conditions. H. H.

Pestalozzi's Influence. — The influence of Pestalozzi very soon spread over Europe and into this country. His influence was most profound in Germany, where Pestalozzian methods were employed as the means for the regeneration of the country after the disaster at Jena. Young Germans were sent to Switzerland to study by the side of the master and returned to their country full of enthusiasm for the new movement. Among these the following may be mentioned, while for further details the reader is referred to the separate articles: Fichte, Froebel, Herbart, Ritter, Harnisch, Zeller, Ramsauer, Plamann, Dinter, Diesterweg, and many others, who contributed by a reconstruction of theory or practice to the reform of methods of instruction in elementary schools and in the training of teachers. In another direction Pestalozzian influence was also powerful; namely, the reform of philanthropic educational institutions and orphan asylums. In Switzerland Pestalozzian methods were early adopted, and through his immediate assistants Pestalozzian influence soon made itself felt. Among these may be mentioned Hermann Krüsi, Sr. (*q.v.*), Gustav Tobler, Nägeli (*q.v.*), and De Guimps, while the work of Fellenberg, Wehrli, and Père Girard (*qq.v.*) was also inspired to some extent by Pestalozzi.

At the time when she might have profited greatly by the Pestalozzian movement, England was too deeply interested in the monitorial system of the two educational societies. But she was not entirely unaffected by the movements, for through James Pierrepont Greaves (*q.v.*) and the Infant School Society (see Infant Schools), and through the Mayos, Charles and Elizabeth (*q.v*), and the Home and Colonial School Society (*q.v.*), some little influence was exerted on English education, even though in the latter case it was somewhat perverted.

In no other country, perhaps, was the Pestalozzian movement so widespread as in the United States. Introduced and naturalized by William Maclure (*q.v.*), the practical side was well illustrated by Joseph Neef (*q.v.*), whom Maclure induced to come to this country. The work was a few years later taken up in New England, and its chief representatives were William Russell, J. G. Carter, Charles Brooks, William C. Woodbridge, A. Bronson Alcott, Lowell Mason, and Henry Barnard (*qq.v.*). This influence was expressed not only in the introduction of reformed methods in schools, but in the foundation of normal schools and a greater interest in public education. The strongest influence, perhaps, radiated from Oswego (see Oswego Movement), whither by different routes the Pestalozzian influence found its way and where too it led to improved schools and the training of teachers. Trained by Edward A. Sheldon and his daughter Mary Sheldon Barnes and by Hermann Krüsi, Jr. (*qq.v.*), teachers in turn spread the Pestalozzian movement far and wide in this country. The culminating point of the movement may be said to have been reached in the introduction of Pestalozzian methods in the schools of St. Louis by W. T. Harris (*q.v.*). Elsewhere the influence of Pestalozzi, if it went no further, may be recognized in the introduction of object teaching (*q.v.*) into the schools. H. H.

See Germany, Education in; Infant Schools; Object Teaching; Oswego Movement; and the articles on Pestalozzi's assistants, *e.g.*, Greaves, Krüsi, Neef, Niederer, Mayo, etc.

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PESTALOZZI-FROEBELHAUS. — An institution established in Berlin for the propagation of Pestalozzian and Froebelian methods and the training of kindergarten teachers. The departments of this school are: (1) a public kindergarten for children from 2½ to 6; (2) an intermediate class for children from 6 to 6½; (3) an elementary class for children from 6 to 7½; (4) manual trade school for boys and girls up to 14; (5) a cookery school; and (6) training school for kindergarten teachers. (For photograph of the school, see article on Kindergarten.)

PESTALOZZI VEREIN. — The name borne by a large number of elementary teachers' benevolent associations in Germany for the support primarily of orphans and widows of teachers. To celebrate the centenary of Pestalozzi's birth, a movement was begun under Diesterweg's (*q.v.*) influence to found a number of orphanages. It was soon felt, however, that it would be preferable to establish a fund to board out orphans and not deprive them of family life. The Pedagogical Association of Dresden established the precedent. In 1846 a number of other organizations bearing the title of *Pestalozzi-Verein* sprang up, and in fifty years spread throughout the whole of Germany. The purposes of the funds were soon gradually extended, — a change made possible by the improved conditions of the teachers in the shape of higher salaries, pensions, and provision for widows and orphans. The funds are now used for the support of (1) orphans up to the age of fourteen or fifteen; (2) of orphans beyond those ages; (3) of widows; (4) of the blind; (5) of needy and convalescent teachers. The funds are obtained from voluntary contributions, concerts, and sales of books, songs, magazines, calendars, etc. A number of societies, however, have practically become insurance companies by making support and its amounts depend on fixed contributions. In this way they have placed themselves under the Imperial Law for Private Insurance Enterprises of 1901.

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PESTILENCE. — See Epidemics.

PETER THE LOMBARD (1100–*c.* 1160). — Theological teacher born at Novara in Lombardy. He studied at Bologna, Rheims, and Paris. At Paris he was, probably, a pupil of Abélard. It is certain, in any case, that he was a careful and sympathetic student of Abélard's method. After being advanced to several ecclesiastical dignities, he was made Bishop of Paris about the year 1158. He soon resigned his see, and died at some time between that year and 1160. Peter owes his importance in the history of education to his *Books of Sentences* (*Quattuor Libri Sententiarum*) written about the year 1145, or, perhaps, a few years later. Although the book and the method which it embodied met with violent opposition at first, especially from the mystics of the School of St. Victor, both ultimately prevailed. The *Sentences* became the textbook of theology in the Schools; it was commented on by all the great teachers in the thirteenth century; its arrangement of topics was followed and its method adopted in all the subsequent *Summæ*, or textbooks of theology. In substance it is orthodox, although a few propositions taken from it were formally condemned. It was recognized by the academic authorities in Paris and Oxford in the thirteenth century as the official textbook, the candidate for the degree of *Magister* being obliged to lecture on the *Sentences* for two years. The essence of its method is dialectical. It is, however, positive, also. Its quotations from the Fathers and the Scriptures are abundant, and one of its chief merits is that it makes use of the *Decretum* of Gratian of Bologna (about 1140). W. T.

See Scholasticism.

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PETRARCH, FRANCESCO (1304–1374). — The great Italian poet and humanist, born at Arezzo, whither his father had fled from Florence. After several changes the family removed to Avignon in 1313, where Francesco studied the humanities for four years under the direction of Convennole of Prato. But his studies did not accord with the wishes of his father, and in 1319 he was sent to Montpellier to prepare for the legal profession. On the death of his father, in 1327, however, he returned to Avignon and shortly after took priestly orders. It was about this time that he met Laura, who inspired his *Canzoniere* and *Sonnets,* which brought him into marked prominence and won for him the favorable notice of men of influence. In 1333 Petrarch yielded to a restless desire to see the world and visited Paris, Ghent, Boulogne, and Liège, meeting well-known scholars and adding to his collection of classical Mss. In 1337 he withdrew to a quiet retreat at Vaucluse, near Avignon, and there published the Latin epic on *Africa,* on the appearance of which he was hailed as the poet laureate of Italy. In 1341 he received the laurel crown from the hands of a Roman senator upon the hill of the Capitol.

During this period three events took place of some importance in shaping Petrarch's life and thought. In 1345 Cicero's *Familiar Letters* were discovered, and Petrarch became the eager student of that famous Roman whom he always acknowledged as his master. In 1348 Laura died, and there can be no doubt that her death was a profound loss to the poet she had so long inspired. But two years later, while passing through Florence on his way to the jubilee at Rome, Petrarch met Boccaccio and then began what was destined to be the deepest and most satisfying friendship of his life. It was beyond question Petrarch's eager enthusiasm for the new learning which inspired his friend and made of Boccaccio another powerful instrument in the spread of humanism.

In 1353 Petrarch abandoned Vaucluse and took up his home in Milan at the court of the tyrant, Giovanni Visconti. Here he held the position of court orator and ambassador, and was sent upon many brilliant missions, notably to Charles IV in 1356. His final home was made at or near Padua under the patronage of the despot Francesco di Ferrara. Here, in his later years, he met the Byzantine Greek teacher Leontius Pilatus, and apparently made an earnest attempt to learn the Greek language. But it is clear that he never mastered its difficulties, for in his well-known letter to Homer (*Fam.* XXIV, 12) he acknowledges that he was "not so fortunate as to have learned Greek." In 1369 Petrarch sought the quiet of the little village of Arquà in the Euganean hills, where he studied with the most unremitting industry, employing a large number of secretaries and copyists. Here he was found dead among his manuscripts and books on July 18, 1374.

The personality of Petrarch is hardly less interesting to the student than his work. In him first flamed the ideal of self-culture, interpreted as the development of a free, enlightened personality through the medium of classic prose and verse. Religious as he was, the conflict between his spiritual interests, as he conceived them, and his intellectual desires was a very real one. Introspective interest in his own mental states, his own soul struggles, mark Petrarch as the first modern man in this regard. The reader has only to scan the pages of his Confessions (*De Contemptu Mundi seu suum Secretum*) to appreciate how conscious of self, of the interest and worth of personal aspiration and struggle, is this pioneer of a new intellectual world-order. While he heaped contempt upon the Averroists for a materialism closely bordering upon atheistic impiety, he yet found it difficult not to regard the great classics of Rome with the same veneration that he bestowed upon the Scriptures. To his impassioned mind Homer, Cicero, and others of the ancient writers lived again, and in his *Letters* he addressed them with enthusiastic greeting. Animated by his ideal of self-culture, he refused appointments which few men would have felt justified in rejecting. Yet in the very heart of his ideal were elements of weakness which increasingly characterized the intellectual revival for which he labored — the tendency to define self-culture as æsthetic and literary appreciation rather than in terms of a dominating social and moral conviction.

When we turn to the scholarship and achievements of Petrarch we cannot fail to recognize the unique character of his services to human culture. He was indefatigable in his zeal for the collection and accurate transcription of manuscripts. Possessed of a truly remarkable power of arousing enthusiasm in others, he influenced a wide and varied group of acquaintances, through his vivid personality and his no less vivid correspondence, and enlisted them in the cause of the new enlightenment. He was in truth the mouthpiece of his age, voicing with enthusiastic conviction what other men felt more vaguely. His scholarship was genuine, if not profound, and was the product of years of intense industry and careful analytic thought. His zeal for the exact transcription of the precious Mss., thus far collected from musty corners of schools and monasteries, led him bitterly to deplore the careless methods of the copyists of his day.

Petrarch's writings comprise his Italian verse (*Canzone* and *Sonnets*), his Latin *Eclogues* and *Epistles*, with the epic of *Africa*, his *Historical Anecdotes*, *Lives of Famous Men*, *Life of Julius Cæsar*, and certain miscellaneous writings, including the *Confessions*, *Orations*, and minor *Essays*. There should be added two serious works on *The Life of Solitude* and *On Monastic Leisure*. His library, dedicated to the Republic of Venice, probably never reached that city. After passing through the hands of the tyrants of Padua and Pavia, twenty-six volumes found their way to the National Library in Paris, where they now remain. A few of his other manuscripts are divided among the cities of Rome, Florence, Padua, Milan, and Venice; but a large number have never been accounted for.

W. G.

See RENAISSANCE AND EDUCATION.

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PETTY SCHOOL. — Schools or classes preparatory to grammar schools in England. The grammar school did not admit pupils until they had learned their "accidents." The petty school received pupils from the age of five and kept them until they could be admitted to the grammar schools, or about three years. The curriculum consisted mainly of learning the A B C and reading of English, with elements of Latin grammar. The term "petty school" did not come into use until the seventeenth century, but the terms "petties," "petits," "pettetes," primarily young children, are already found in the preceding century for lower school pupils. The master of the grammar school was not expected or compelled to teach the petties; they might be under the charge of an usher, or the master might "assign so many of his scholars in the third and fourth forms as may suffice to instruct them" (Guisbrough Grammar School, 1561). Of course the preparatory training of the petties might be given by private schoolmasters, dame schools (*q.v.*), song schools (*q.v.*), etc. As used by Hoole (*q.v.*) in his pamphlet on the *Petty School,* the use of the term is extended to include not only pupils preparing for the grammar school, but those who are unable to profit by a grammar school education and remain in the petty or elementary school for a curriculum including English literature, writing, and arithmetic. This use may be compared with the *Petites Écoles* (Little Schools) of the Gentlemen of Port Royal (*q.v.*), a use of the term which was common in Paris in the Middle Ages for elementary schools, as opposed to the high or grammar school (*Grande Ecole*) under the chancellor.

See Abcdarians.

PETTY, SIR WILLIAM (1623–1687). — Political economist, born at Romsey, England, the son of a clothier. After attending the grammar school at Romsey and early showing considerable mechanical ability, he went to sea, and later entered the Jesuit College at Caen in France. For a brief period he was in the royal navy, but later he studied at Utrecht, Amsterdam, and Leyden, whence he proceeded to Paris, where he met Hobbes and Father Mersenne, mathematicians and friends of Descartes. On his return to England he took up his father's business for a time and invented a manifolding machine, the "Pentograph," which brought him considerable fame. He again took up the study of medicine, which he had begun at Leyden, and took the degree of Doctor of Physic at Oxford in 1649 and became fellow of Brasenose College and professor of anatomy in 1651. He was appointed physician-general to the army in Ireland in 1652, and while there helped to survey the country in a scientific manner and with much rapidity and thoroughness. At the Restoration, Petty, who sympathized with the Cromwellian party, was deprived of his appointment, settled in London, and became a member of a scientific coterie there. On the incorporation of the Royal Society (1662), which in part was inspired by an early work of his, Petty was knighted. He devoted much time to mechanical inventions, among them "a wheel to ride upon" and a double-keeled vessel. Both Evelyn and Pepys speak in high praise of his versatility.

Of his writings the larger number deal with questions of political economy. He urged the establishment of a statistical bureau, and himself wrote a number of essays in *Political Arithmetick.* In 1662 he wrote a *Treatise of Taxes and Contributions*, which gives a correct account of the origin of wealth. In the field of education, his most interesting work is the *Advice of W. P. to Mr. Samuel Hartlib, for the Advancement of some particular Parts of Learning,* written in 1647–1648. It consists of four parts. The first commends Hartlib's proposed *Office of Publicke Addresses*, a central bureau of information, research, and compilation of bibliographies. Various departments are described and in their comprehensiveness recall Bacon's *New Atlantis.* The "Gymnasium Mechanicum or Colledge of Tradesmen for the Advancement of all Mechanical Arts and Manufactures" was to be an institution for the encouragement of workmen to perfect their work; they were to be granted free dwellings and fellowships to encourage them in continuing at their particular branch. The study of pure science was to be pursued at the "Nosocomium Academicum," a combination of hospital, museums of different kinds, observatory, library, collections, "an Abstract of the whole world."

The education of children is dealt with in the second part of the *Advice.*

Petty in his comprehensive view of the school does not neglect the teachers, and hopes that "the business of education should not be (as now) committed to the worst and unworthiest of men, but . . . be seriously studied and practised by the best and ablest persons." To this end he recognizes the value of a study of individual children and advises "That effectual Courses be taken to try the Abilities of the Bodies and Minds of Children, the strength of their Memory, inclination of their Affections either to Vice or Vertue, and to which of them in particular, and withall to alter what is bad in them, and increase and improve what is good, applying all, whether good or bad, to the least Inconvenience and most Advantage."

Petty's *Advice* should be classed with Milton's *Tractate* and Locke's *Thoughts* among the most valuable contributions to the development of educational theory in England.

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PHARMACY, EDUCATION IN. — Historic Development. — In order to understand the present status of pharmaceutical education in this country, it is necessary to recall that, unlike the learned professions, pharmacy is still clinging to the apprenticeship system, and this in spite of the universally recognized deterioration of the modern drug store as an educational factor.

Though the pharmacist has had his precursors in antiquity and during the middle ages, he traces his direct descent from the Italian apothecary of the Renaissance, who had his professional birth in the edict of 1224, issued by the emperor Frederick II. This edict created the public apothecary and established his relation to the physician and to the public. From Italy the apothecary crossed the Alps into Germany, France, and England. Although some of the apothecaries completed their education at the Italian and later at other universities, the large number were trained exclusively in the shops of their preceptors. In England they seem to have played, at least in part, the rôle of assistants to physicians, as seen in Chaucer's *Canterbury Tales*; later they entered into serious competition with the physicians, and since the beginning of the eighteenth century have been licensed as general medical practitioners. Their place as apothecaries, in the continental meaning of the term, was filled by the present-day chemist and druggist.

In Paris the apothecaries were organized into a gild, first with the wealthy spicers, later independently of them. As such they had charge of the education and examination of apprentices. Shortly before the French Revolution the apothecaries' gild of Paris was reorganized as a college of pharmacy, *i.e.* as a corporation of the master pharmacists. Being thus proclaimed as professional rather than as commercial men, the duty of the proper education of their apprentices was thereby made more important than before. However, the Revolution disposed of all special privileges. Since then the education of the prospective pharmacist has been regulated by the state.

In Germany, where the system of concessions of apothecary shops was continued after the political and economic reorganization that followed the Napoleonic wars, the apprenticeship was taken very seriously. The apothecary shop served not only as a means of educating the pharmaceutical apprentice, but, before the days of Liebig's laboratory at Giessen, also as almost the only means of acquiring a practical knowledge of chemistry. Hence Liebig, although he wanted to become a chemist, served an apprenticeship in the apothecary shop at Heppenheim. Indeed, it would seem that Trommsdorff's private school, maintained in connection with his apothecary shop at Erfurt, must have suggested the idea of laboratory instruction to Liebig.

In England the development of pharmacy was hampered not only by commercial, but by medical tendencies. Among the small traders on Chepe Street, London, were the spicers and pepperers, the latter being organized into a gild as early as 1180. Out of these developed the grocers, the sellers *en gros*, who received their first charter in 1429. On them were conferred the charge of the king's beam, the exclusive power of garbling drugs, spices, and imported merchandise, and the duty of examining the drugs and medicinal wares sold by the apothecaries.

The earliest apothecaries in England appear to have come from France in the fourteenth century. Not satisfied with the mere preparation of medicaments, they soon indulged in medical practice. Their charter of 1617 freed them from their old enemies, the grocers, but their medical practice brought them into conflict with the College of Physicians incorporated in 1511. After a long quarrel, in which even men of letters took part, the apothecaries came out victorious in 1703, since which time they have been recognized in England as medical practitioners. Preferring the keeping of shop to medical practice, some of the assistants of apothecaries, as well as others, developed into druggists proper, such as was Drugger, one of the characters of Jonson's *Alchemist.* Conflict between these and the apothecaries over the recommendation of medicines for the sake of gain, led to the incorporation of the Pharmaceutical Society of Great Britain in 1842, which was given power to control its own educational policy.

Such a development, coupled with the general *laissez faire* policy of England, could not produce a highly developed calling of the pharmacist. The chemist in England, as Liebig wrote to his friend Woehler in the fifties of the past century, is not a chemist but an apothecary. Yet according to English laws, the apothecary is a general medical practitioner, not an apothecary or pharmacist in the continental sense of the word.

United States. — Although the colonies and the original thirteen United States obtained such meager pharmaceutical literature as was available to them almost entirely from Great Britain, the idea of organizing local colleges appears to have been taken from France. Thus, when the University of Pennsylvania in 1821 took steps to improve the educational status of the local apothecaries, some of the Philadelphia druggists resented this as interference, and organized a college of pharmacy, *i.e.* a corporation of local druggists. One of the objects of this body was to provide more systematic instruction than could be offered to apprentices in the exacting occupation of drug-store life. Evening lectures during the winter were provided and a "school" was started by the college.

The other larger cities followed the example of Philadelphia in the organization of some of the more ambitious local druggists as colleges of pharmacy, viz. Boston in 1823, New York in 1829, New Orleans in 1838, Baltimore in 1841, Cincinnati in 1850, Chicago in 1859, St. Louis in 1864, Mobile in 1866. But whereas the Philadelphia College of Pharmacy began its educational activities almost immediately, the Massachusetts College of Pharmacy, although the second to effect organization, did not seriously assume its educational obligations until 1868.

As already pointed out, these colleges of pharmacy were corporations of local druggists organized for general professional purposes. Incidentally most of them provided more or less regular courses of evening lectures for the benefit of their apprentices, and later for such others from a distance as did not enjoy similar advantages at home. An attempt to foster pharmaceutical education by means of a conference of delegates of the colleges — not of the faculties of their schools, it should be noted — was made between the years of 1870 and 1882, but failed. During this period six new colleges were organized, viz. those of Louisville (1870), San Francisco (1872), Washington (1872), Pittsburg (1878), Albany (1881), Cleveland (1882).

It was about this time that the state universities of the old Northwest Territory began their period of phenomenal development. The University of Michigan, which had given pharmaceutical instruction since 1868, reorganized this department in 1876. Wisconsin followed in 1883, Indiana in 1884, Ohio in 1885, Illinois in 1887 (since abandoned for an affiliation with the Chicago College of Pharmacy). Since then many states west of the Mississippi have offered similar courses of instruction. Owing to the lack of endowment or other support, the older colleges had to restrict their required instruction to lectures and occasional quizzes. With the state universities, the laboratory at once took its place as one of the most important means of imparting instruction in the basal sciences and their pharmaceutical application.

The fourth period is that of the second conference, the Conference of Pharmaceutical Faculties, organized in 1900. Of possibly more than eighty institutions in the United States, thirty-two belonged to this conference in 1910. Its standards are still very low, but it must be remembered that, until favored by legislation, the older eastern colleges had no entrance requirements whatever. Although a prerequisite law has been in force in the state of New York since 1905, the minimum number of hours of instruction demanded by the Department of Education does not yet exceed 1200 hours, about one half of which must be laboratory work. The state universities demand about twice this amount in their two-year courses. Based on one year of high-school work as a general preparation, and in many states not even that, pharmaceutical education in this country has still much to strive for.

In order to appreciate why such a low standard prevails in spite of the desire of many an institution to raise the standard, it is necessary to know that the state boards of pharmacy, and not the educational institutions, are the controlling factor. Since about 1875 the practice of pharmacy has been controlled in one state after another by legislation. These state pharmacy laws have created state boards which pass upon the qualification of candidates for registration. As a rule, two classes of pharmaceutical practitioners are recognized by these laws: first, the registered pharmacist, who enjoys full privileges in the practice of his calling; and second, the assistant pharmacist, who enjoys limited privileges only. Until recently no special schooling of any kind was demanded. In addition to the requisite four or five years of drug-store experience demanded by law, the prospective pharmacist could prepare himself for the state board examinations in whatever manner he saw fit. Quiz compends and cramming schools have played an important rôle in this preparation for the state boards. Correspondence courses have also given some aid. Inasmuch as in the case of failure a candidate can repeat *ad libitum* his experience before the board, these examinations themselves have been a farce.

New York was the first state to have a pharmacy law. About thirty-five years later it became the first state to enact prerequisite legislation, *i.e.* legislation making graduation from a recognized school a prerequisite to the state board examination. Similar legislation will no doubt spread. Thus a minimum of technical education will gradually be provided for, but the even more fundamental general education is still in a sad plight. Only a few universities have thus far been in a position to demand graduation from a high school or similar preparation as a prerequisite for a course in pharmacy.

In like manner as the pharmaceutical faculties have organized for conference, so the state boards have organized a National Association of Boards of Pharmacy. Much good in the way of harmonizing ideas and even requirements has already been accomplished. So long, however, as these boards are composed exclusively, or well-nigh so, of retail druggists, much progress cannot be expected. The several boards of pharmacy, medicine, health, etc., of a given state will have to be reorganized into one board of health and sanitation, on which pharmacy is represented, before any radical change can be expected.

Yet in spite of this rather unfavorable state of affairs progress is being made. While the grandeur of buildings, not infrequently burdened by a heavy debt, is the most striking outward sign, more subtle forces for advancement are at work. In 1892 the University of Wisconsin for the first time offered a four-years' course, on a par with the regular college course, leading to a bachelor's degree. Since then a number of other universities have followed. Thus, a very different ideal is being held up to the pharmacy student. Even graduate work is being done.

With the older colleges, the school work was and still is supplementary to the training received by the apprentice in a drug store. At first certificates of attendance upon lectures were given, later the degree of graduate in pharmacy was conferred. The University of Michigan early followed English practice and gives the degree of pharmaceutical chemist. Some institutions also gave the degree of bachelor of pharmacy. A number of the eastern institutions now give the degree of doctor of pharmacy. The University of Michigan first broke away from the drug store experience requirement for graduation. Even the older colleges of the East now offer courses and degrees to those who have not had such experience, but this is not the rule. In many of the colleges of pharmacy of the larger cities, the college work is so arranged that the student can spend more than one half of his time in the drug store while attending college. All of the colleges belonging to the Conference, however, have abandoned evening instruction, though to a large extent they still maintain the character of a *Fortbildungs-Anstalt.*

Germany. — In Germany a compromise system also exists, but on a much higher plane. The apprentice must have passed the *Einjährig Freiwilligen Examen, i.e.* he must have passed the *Unter-Sekunda* of the Gymnasium. After an apprenticeship of three years he takes the assistants' examination before a local board. After three years as assistant he goes to the university for four semesters and then presents himself to the state board, consisting mostly of university professors, with one or more *Apotheker.* Not a few German pharmacists, however, have completed the entire course of the Gymnasium, have continued their university studies after the *Staatsexamen,* and have taken the degree of Ph. D.

France. — While Germany recognizes a second class of pharmaceutical practitioners, viz. the *Drogist,* France has abolished its second-class pharmacists as well as the former herbalist, and now recognizes but one class, viz. the pharmacist of the first class. Although the apprenticeship still plays a rôle in the education of the French pharmacist, only such pharmacies may now accept apprentices as are licensed for this purpose by the Superior School of Pharmacy. The Paris school is a part of the Universty of Paris and gives a three years' course for *pharmacien,* and four years for *pharmacien supérieure.* Like many a German *Apotheker,* so not a few French *pharmaciens à première classe* continue their university studies for the degree of doctor of pharmacy, which in France is in every way the equivalent of the degree of doctor of philosophy. (See France, Education in, under Higher Education.)

England. — As already indicated, in England the examination of the Chemist and Druggist has been the special privilege of the Pharmaceutical Society of Great Britain since 1868. This society maintains a school in Bloomsbury Square. Still, most of the candidates for this diploma attend other schools. The course for the Chemist and Druggist at Bloomsbury Square covers one year. A second year is offered for those who aspire to the honors of Pharmaceutical Chemist. A movement is on foot to improve the educational status of the British pharmacist. One suggestion looks toward the establishment of a five-year curriculum, or more correctly an apprenticeship of five years, supplemented by systematic science courses in the technical schools conducted by the county committees or boards. So long as the education of the future pharmacist is a special privilege rather than a public duty, no fundamental reforms can be expected. Recently some of the newer universities have taken up the subject of pharmaceutical education neglected by the older ones. With these may rest the higher development of pharmaceutical education in Great Britain.

Other Countries. — In Austria, Switzerland, and the Scandinavian countries, also in Russia, pharmaceutical education follows, more or less, along German lines. The other Romance countries follow France to the extent of their ability. E. K.

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PHELPS, ALMIRA HART LINCOLN (1793–1884). — Pioneer in the movement for the higher education of women and author of many science textbooks; was educated in the Berlin (Conn.) Academy and studied botany, geology, and chemistry privately under Professor Amos Eaton (*q.v.*) of the

Rensselaer Polytechnic Institute at Troy. She taught in the district schools of Connecticut, was instructor of science in academies at Berlin, Conn., Pittsfield, Mass., and Sandy Hill, N.Y. For several years she was an instructor in the Female Institute at Troy, N.Y., conducted by her sister, Mrs. Emma Willard (*q.v.*). She was later principal of a school at West Chester, Pa., and her last work was as principal of the Patapasco Institute at Ellicott's Mill, Md., where she trained many distinguished women teachers. She was an ardent advocate of the scientific *vs.* the classical and literary education for women; and she was the second woman (Professor Maria Mitchell was the first) to be elected to membership in the American Association for the Advancement of Science (*q.v.*). Her publications are numerous; *Lectures on Botany* (1828), *Dictionary of Chemistry* (1829), *Botany for Beginners* (1833), *Female Student* (1833), *Geology for Beginners* (1834), *Chemistry for Beginners* (1835), *Lectures on Natural Philosophy* (1836), *Natural Philosophy for Beginners* (1836), *Lectures on Chemistry* (1837), and *Hours with my Pupils* (1858). With her sister, Mrs. Willard, she translated from the French (1834) Mme. Necker de Saussure's (*q.v.*) *Progressive Education.* She wrote many papers on the higher education of women, several of which were translated into French; and she was active in the American Association for the Advancement of Education (*q.v.*).

W. S. M.

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PHENOMENALISM. — A name given to two different types of philosophy. According to one theory, what we know is simply the appearances of real things, these appearances consisting of the impressions which they make upon the mind. This view includes within itself many philosophies otherwise diverse from one another. Kantian phenomenalism, for example, is distinguished by the emphasis which it lays upon the synthetic activity of *a priori* powers of the mind in transforming passive impressions into objects concerning which universal judgments are possible. Spencerian phenomenalism emphasizes the fact that the unknowable things-in-themselves have gradually molded the mind, through heredity, in the long-continued evolutionary process, so that the impressions made upon it arrange themselves in modes which somehow parallel the relations of things-in-themselves. The other type of phenomenalism is radical. It holds that there are no things-in-themselves back of the phenomena and causing them, but things are what they are known to be. Shadworth Hodgson in England and Renouvier in France are the best known modern representatives of this kind of phenomenalism. Its influence in developing the radical empiricism of James was considerable.

J. D.

PHILADELPHIA CENTENNIAL EXPOSITION. — See Expositions, International, and Education.

PHILADELPHIA, CITY OF. — The chief city in the state of Pennsylvania, and the third city in size in the United States. Its population in 1910 was 1,549,008, which was about one fifth of the total population of the state.

Educational History. — The colonial history of education in Philadelphia has been traced, under the history of education in the state of Pennsylvania (*q.v.*). Private and denominational schools were established from time to time, and these supplied the educational needs of the city until the nineteenth century.

The state laws of 1802 and 1809 provided for the organization of pauper schools, but not much was accomplished in the city under it. Under a supplement to the 1809 law, secured in 1812, the county commissioners and the councils were enabled to organize a few schools. In 1814 the "Pennsylvania Society for the Promotion of Public Economy" was organized, with Roberts Vaux as chairman of the subcommittee on public schools. In 1817 a number of schools after the Lancasterian plan were opened in Philadelphia, and in 1818, as an outcome of agitation, the legislature organized the county of Philadelphia as the First School District of Pennsylvania, and provided for the education of the children of the city at public expense. The city was divided into school districts; directors were appointed, one for each section, to be known as the Board of School Controllers. The beginnings of the dual control, which so long continued, were here made by giving the appointment of teachers to the directors for each section. The schools were open only to indigents. A model school, under Joseph Lancaster himself, was opened in 1818 for the training of teachers. In 1827–1828 three Infant School Societies were organized in Philadelphia, and by 1830 some ten such schools were in existence in the city. In 1832 the Controllers opened an Infant Model School for the training of teachers for the Infant Schools, and in 1837 thirty primary schools, under the charge of women teachers, were established as a result of the movement. The model school lapsed and became a grammar school after four years, and the real city normal school was not established until 1848.

In 1827 "The Society for the Promotion of Public Schools" was organized, and this Society undertook to agitate for a better public school law. The state law of 1834, establishing a general system of common schools (see Pennsylvania, State of), was in part the result of the work of this Society. The revised law of 1836, which really established the system, contained two provisions of special interest to the city of Philadelphia. By the first, the Board of Controllers of the Public Schools were authorized to establish a central high school, and by the second, the obligatory use of the Lancasterian system and the limitation of the schools to indigents were withdrawn. The central high school was opened in 1838. This was followed, in 1848, by the establishment of the Girls' High and Normal School, the first city normal school in the United States.

In 1854 the Consolidation Act combined the city and county of Philadelphia, and annexed a number of suburban towns. For each of these a new sectional board was created, and local or sectional interest now attained new importance. Gradually increasing with the growth of the city, there were 31 sectional boards with 403 members by 1880, 34 sectional boards with 455 members by 1889, 41 sectional boards with 533 members by 1900, and 43 sectional boards with 559 members by 1905. In that year the law was revised; the old Board was legislated out of office, a Board of Education of 21, appointed from the city at large by the judges, took their place, and the local boards, while continued, had their powers materially curtailed. The new Pennsylvania school code of 1911 made still further changes.

Present School System. — The control of the schools of the city is vested in a Board of Public Education of fifteen, appointed by the Judges of the Court of Common Pleas of the city, and for six-year terms. One third go out of office each biennium. For each of the municipal wards of the city a Board of School Visitors of seven members is elected, for four-year terms, approximately one half going out of office each biennium. The members of these Boards of School Visitors are paid $25 (formerly $100) a year, are required to visit the schools every three months and inspect them, and to make reports as to their inspection and as to the needs of their district to the Board of Public Education. They may also appoint the janitors for the elementary schools of their ward. The City Controller is elected as controller for the Board of Education, and approves all orders on the school treasurer, certifies to all contracts made, and keeps a record of the budget and funds of the Board. A Secretary is elected from outside the Board, while the City Treasurer acts as treasurer for the Board. The Board also elects a Superintendent of Buildings, a Superintendent of Supplies, and a Superintendent of Schools. The Board of Education defines the general policies of the school system, enacts all necessary legislation, determines the tax levy and directs expenditures, appoints teachers and other employes, and determines the qualifications and salaries of all employes. The supervision of the school system is vested in the Superintendent of Schools, the associate superintendents, and the assistant (or district) superintendents. The supervision of instruction is in the hands of the school principals and of the assistant superintendents. The Board may appoint a board of city examiners, on nomination of the Superintendent of Schools, to examine teachers for the city, and of this board the Superintendent is *ex officio* chairman. The Superintendent of Buildings must be an architect or an engineer, and he has charge of the building, repair, and maintenance of all school buildings. He appoints all of his assistants, and all janitors, except for the elementary ward schools, and may remove even these for cause. The Superintendent of Supplies makes all purchases of supplies and books, and attends to their distribution. The Board may levy an annual city tax of not less then five nor more than six mills, for all maintenance purposes. They may also issue bonds for sites, buildings, or debts, up to a total of 7 per cent of the assessed valuation of the city. If the school debt is less than 2 per cent, the Board may borrow money on notes, up to ½ of 1 per cent. They may also designate any bank as a depository for the school funds.

The school system of the city contains a large number of different types of schools, adapting it to the needs of a large and cosmopolitan city. A city normal school, with a three-years' course beyond the high school; the central high school for boys, with a School of Pedagogy as an adjunct; two high schools for girls, one of which is a vocational high school; three manual training high schools; one day and two evening trade schools; a number of district high schools, in part as branches of the above; evening high schools and trade-school classes in nearly all of the higher schools; a number of special disciplinary and special backward classes; day and evening elementary schools; evening schools for aliens; kindergartens; an industrial art school; many playgrounds; school gardens; open-air schools; public lectures; and much special instruction indicate the nature and extent of the city's school system. In 1910 the system required 4609 teachers and supervisory officers, and enrolled 175,549 pupils. The total value of all school property employed in 1910 was $20,632,630, and the total expenditures for all purposes $8,242,218.

E. P. C.

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PHILADELPHIA, INTERNATIONAL CONGRESS OF EDUCATION AT. — See International Congresses of Education.

PHILANTHROPINISM. — A movement which derived its name from the *Philanthropinum* established at Dessau by Basedow (*q.v.*), in 1774. The term denotes the humanitarian tendency which inspired the movement. Few educational institutions have had such immediate influence. The movement was strong enough to attract and hold the interest of men in all ranks of life and of divergent religions and philosophical views. The *Philanthropinum* was the first school which was established under the impulse given by Rousseau's *Émile.* It aimed to train up citizens of the world, men who recognized the community of interest among all human beings. Rich and poor boys were taught together; distinctions of religion were not recognized; manual and industrial work was introduced for social as much as educational reasons. The vernacular was emphasized as the medium of instruction. Things were placed before words, and if objects could not be obtained, pictures and illustrations were used. Grammar was given a secondary place and languages were taught by improved methods. Everything was done to make learning attractive and experience as broad as possible. Special attention was given to physical exercise, health, and diet. Among ardent supporters were Kant, Lessing, Moses Mendelssohn, Iselin, Von Rochow. But there were opponents, too; mainly theologians and old teachers. Basedow himself was assisted by Wolke, Simon, Schweighäuser, Campe, Trapp, Salzmann. The *Philanthropinum* at Dessau continued from 1776 to 1793, but Basedow was not director throughout that period. Campe (*q.v.*) opened a similar institution at Trittow, near Hamburg, in 1777, and was succeeded in 1783 by Trapp (*q.v.*), who had been professor of pedagogy at Halle (1777–1783). In 1781 Salzmann (*q.v.*) established with the favor of Ernest II of Saxe-Gotha a *Philanthropinum* at Schnepfenthal which has continued to the present day. Outside Germany the influence of *Philanthropinism* was strongest in Switzerland. In 1774 Charles Ulysse de Salis transferred to his castle at Marschlins in Grisons a school which had been established in 1761 by Martin Planta. Karl Friedrich Bahrdt was placed in charge, but left in 1776 to open a *Philanthropinum* at Heidesheim. Another school of this type was opened by J. B. de Tscharner at Jenins in the same district and transferred to Reichenau in 1796 where it met with great success under H. Zschokke.

The Philanthropinistic movement was as influential as the Pestalozzian in drawing attention to existing defects in education and in leading to salutory reforms. A large body of literature was inspired by it; Campe's *Allgemeine Revision des gesammten Schul- und Erziehungswesen* in sixteen volumes, and his *Braunschweigischer Journal*, and Trapp's *Versuch einer Pädagogik* may be mentioned. In another direction the new attitude to children led to a large number of books written for children by Campe, Salzmann, and others.

See Basedow; Campe; Gutsmuths; Salzmann.

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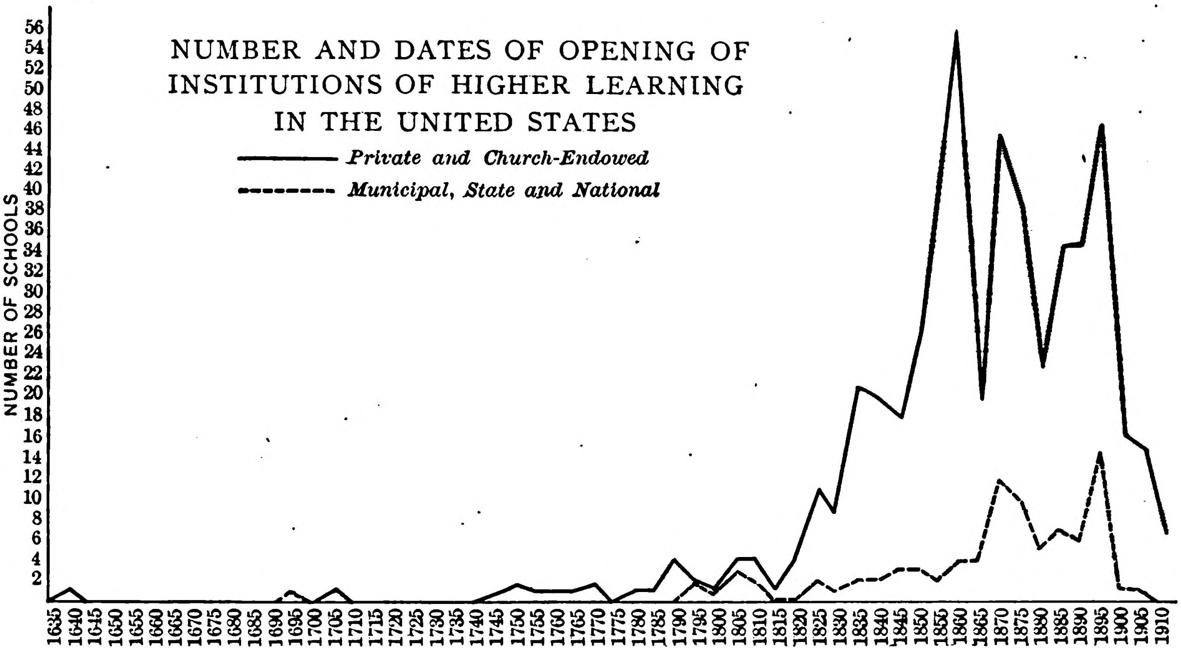
PHILANTHROPY, EDUCATIONAL. — The custom of giving for educational purposes is one of long standing and of the greatest importance. It finds numerous illustrations in the classical period and, as connected with the church, became widespread and of fundamental significance during the late medieval centuries. Following the Reformation, there was a marked decline in this custom, but there were periods in English educational history wherein charitable gifts for education again became very general, first through the interest of dissenting bodies in developing higher educational interests of their own and later through the interest of the established church in building up an elementary school system, the so-called charity schools (*q.v.*). The entire historical phase of this topic of educational philanthropy is presented under the caption Endowments (*q.v.*). But it seems quite evident that the existence of an established church and the growth of state subsidized or supported school systems, first on the continent and later in England, has resulted in the atrophy of this significant social custom. In America, owing partly to the absence of an established church and, even when local or general governmental support of education became general, partly to the fact that such support awaited the initiative and coöperation of the people themselves, private philanthropy has played a very large part in the development of the entire educational system.

At present the extent of private philanthropy for educational purposes is one of the most significant phenomena in American life, and certainly when compared with conditions in other countries one of the most significant features of the educational system. In 1910 22 per cent of the entire income of the 602 universities, colleges, and technological schools reporting to the United States Commissioner of Education came by way of benefaction, in amounts ranging from sums of a few dollars to over a million; and over 52 per cent of these gifts was applied as permanent endowment funds. Five hundred and thirteen of these institutions are controlled by private corporations and eighty-nine by city, state, or nation. These facts alone point to the present significance of philanthropy in higher education in the United States.

Doubtless the same instinct, fundamental to group life in general, which prompts the humblest man to relieve his brother in distress, is finding here in man's higher intellectual aspirations a suitable interest for the bestowal of charity. The one type of giving is prompted by immediate needs, and seeks only to conserve; the other by remote needs, and looks toward progress. If the one is socially negative the other is as distinctly positive. And regardless of the theories of Turgot, Adam Smith, Hobhouse, and others, that the " dead hand " policy in education is inimical to progress (see ENDOWMENTS), yet, as will be seen in the following diagrams, gifts and bequests have played and are playing no small part in making our higher institutions of learning what they are. The following chart, including the 602 institutions referred to above, will indicate, so far as numbers of schools can indicate, the part which philanthropy has played in establishing colleges and universities from the beginning down to 1910.

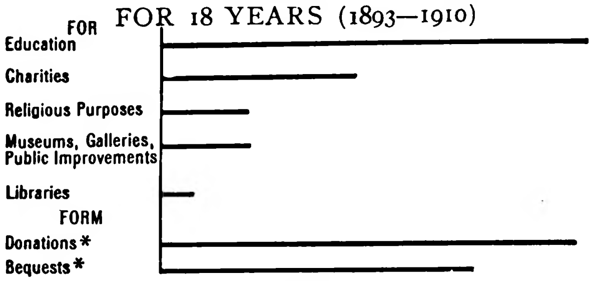


The early history of higher education is a very simple story, and the extremely local nature of our early foundations, such as Harvard and Yale, which were built for and by Massachusetts and Connecticut respectively, and for years developed according to their neighborhood interests, stands out in strong contrast to the recent foundations of Chicago and Stanford Universities, the Carnegie Institution, and the General Education Board, whose interests are at least national, and which are in no sense products of local causes and conditions. These tendencies seem to indicate that philanthropic interests and methods have kept pace with our rapid development in population, wealth, and business methods. The simple gifts of " sheep, cotton cloth worth nine shillings, a pewter flagon worth ten, and such silver goods as fruit dishes, silver spoons and jugs," recorded among Harvard's early receipts do not seem to foretell the millions in stocks, bonds, and real estate which are among her more recent gifts. From an analysis of gifts to educational institutions it is clear that relative to the total annual income, religious interest is on the decline, and scientific interest is increasing; that the qualifications of scholarship are replacing those of indigence, that it is a specific rather than a general educational interest which prompts the gift, and that the number of interests has increased correspondingly with the number of professions and callings that have gradually been opened to college graduates.

The following analysis of the gifts recorded in the Appleton and International *Yearbooks* and the *World's Almanac* — gifts of five thousand dollars and over, made during the years 1893 to 1910 — will suggest the relation of educational to other kinds of philanthropy in this country during recent years. As to form, it will be noticed that there is a slight tendency toward gifts rather than bequests; and that education is receiving more than half of all the gifts.

The actual importance of these gifts in the support of higher education is seen in the diagram on page 670, statistics for which were compiled from the annual *Reports* of the United States Commissioner of Education. As permanent endowment funds accumulate, naturally income from that source increases, consequently 22 per cent of the total income in 1910 means much more than a similar proportion in 1871. Statistics for the past few years show that about 50 per cent of all gifts to higher education are applied as permanent endowment, over 30 per cent goes to buildings and improvements, and less than 20 per cent for current expenses.

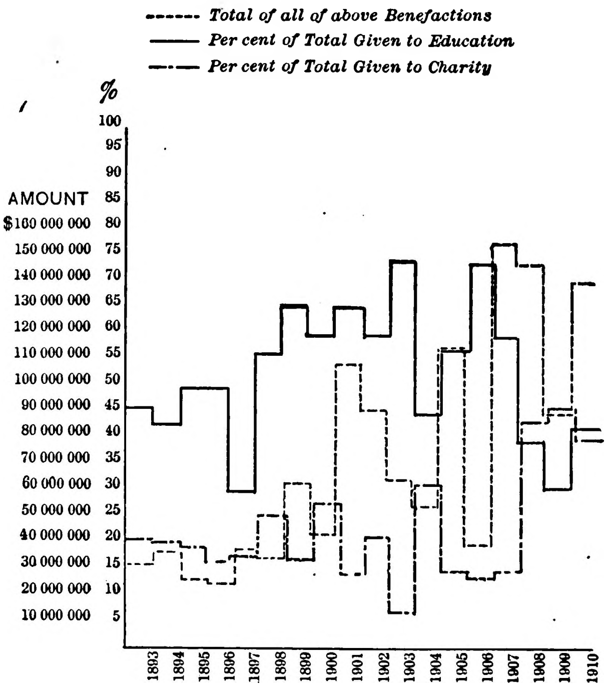
TOTAL BENEFACTIONS IN THE U.S. FOR 18 YEARS (1893—1910)



**No data for 1905*

Unlike England, philanthropy has had little to do with elementary education in this country during its early history, and save indirectly it has done little in later years. The Peabody Education Fund of $3,000,000, established in 1867, was used during its first four years in starting city systems of public schools in towns and cities throughout the southern states, then to 1875 it was used to aid in the establishment of state systems of public schools. Its next work, 1875 to 1904, was to aid elementary education indirectly by the training of teachers and by establishing the idea of state normal schools throughout the south. The John F. Slater fund of $1,000,000, established in 1882, is devoted to the training of colored children in industrial pursuits; the Anna T. Jeanes Foundation (1908) of $1,000,000 is to be devoted to the fostering of negro rural schools; while the studies made by the Russell Sage Foundation are indirectly devoted to this end. These are a few noteworthy cases in recent years but do not suggest the educational, social, and industrial problems which philanthropy sought to solve in England through the endowed, the charity, and the workhouse schools.

The problems of secondary education have received some attention. Most of the early endowed and church colleges had preparatory departments, and many such are still maintained. The history of the academy move-

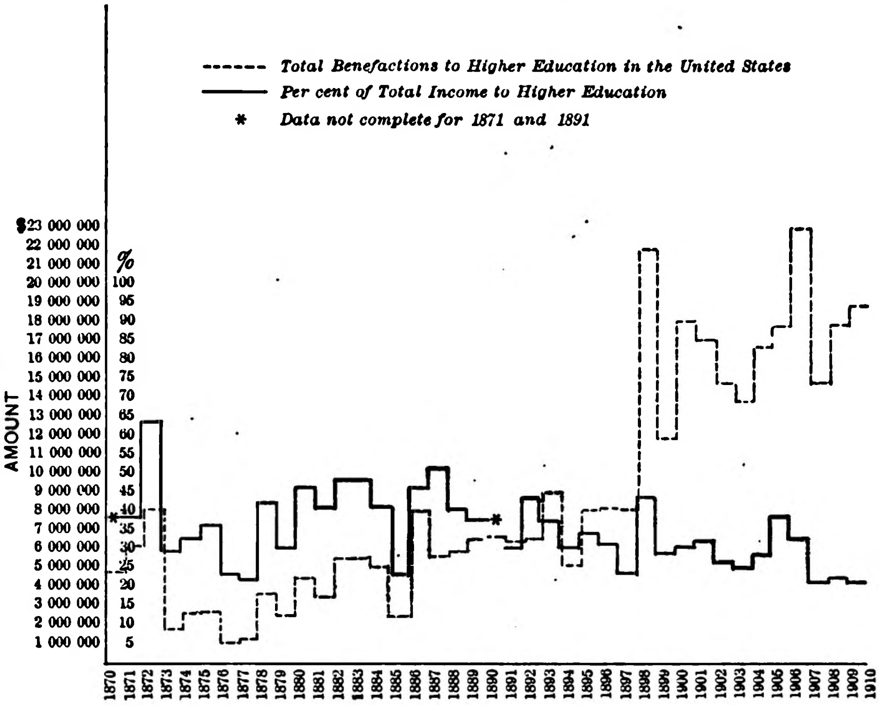


DISTRIBUTION OF ALL BENEFACTIONS IN THE UNITED STATES

Date	Per Cent of Total given to					Form of Gift	
	Education	Charity	Religious Purposes	Museums and Public Improvements	Libraries	Donations %	Bequests %
1910	43	38	8	6	5	70	30
1909	31	46	15	5	3	47	53
1908	40	44	4	10	2	48	52
1907	58	16	4	20	2	67	33
1906	79	15	4	2	0	83	17
1905	57	18	17	8	0	*	*
1904	45	29	9	14	3	30	70
1903	75	7	3	9	6	60	40
1902	60	21	6	8	5	49	51
1901	66	13	5	7	9	73	27
1900	54	27	7	5	7	55	45
1899	66	18	10	3	3	69	31
1898	57	25	7	7	3	54	46
1897	31	17	13	35	4	32	68
1896	50	16	19	9	6	48	52
1895	50	19	12	12	7	66	34
1894	43	20	11	17	9	17	83
1893	47	21	14	6	12	28	72

* Data inadequate.

ment is to a large extent the history of private munificence in an effort to solve some of the problems of secondary education. The work of the General Education Board (1902) was, up to 1905, devoted to secondary, rural, and negro education in the southern states, and one of its present aims is the development of a system of public high schools in the south.



The experience of England which resulted in the establishment of government commissions for the investigation of the influence of the "dead hand" in education, and finally in 1869 in the Endowed Schools Act (*q.v.*) should have suggested to America the wisdom of accepting the aid of philanthropists in education with due precaution. The early gifts to Harvard, Yale, and Columbia were in large part direct to the college, leaving the Trustees to apply them as they saw fit. Yet the early Presidents of Yale several times complained that with all the money received, so much of it was given for the development of some particular, often some new, line of work that the college was very much in need of funds. A gift for a new wing to a hospital lays upon future benefactors the burden of its support. Many peculiar and too often unwise gifts have thus been made in the brief history of American philanthropy. Yet, if we take note of the modern methods in giving, there seems to be reason to believe that we are forestalling some of the misfortunes which befell the endowed schools of England. In 1867 George Peabody, probably through the assistance of Robert C. Winthrop of Boston, suggested a new and important idea in philanthropic methods. With him there not only began a new era in respect to the size of gifts, but he attached no religious or ecclesiastical condition to his gift. The only conditions governing its administration are general in character, and adequate provision is made for further modifications as social and educational changes seem to warrant. Since this foundation there have been established six others — the John F. Slater Fund, the Carnegie Institution, the General Education Board, The Carnegie Foundation for the Advancement of Teaching, the Russell Sage Foundation, and the Annie T. Jeanes Foundation — ranging in amounts from one to over $50,000,000, and in the provisions for the administration of these funds and their income the ideas of Mr. Peabody are embodied. Still more recently (1911) are the Rockefeller and the Carnegie Foundations chartered under special acts of the state of New York. (For the particular influence of each of the great foundations upon American education, see articles under their respective heads.) J. B. S.

PHILANTHROPY, EDUCATIONAL ASPECTS OF MODERN. — The earlier conceptions of charity regarded it chiefly from two aspects, neither of which related it to educational work. It was regarded first as a means of promoting the spiritual development of the donor, and second, as the distribution to unfortunates of a bounty, prompted by sentiment and not based on rational grounds. The bestowal of alms was an event which did not relate itself in any important way to the life history of the donor, or to that of the recipient. In the case of the donor it was a distribution of a surplus by methods having no relation to those by which the surplus was acquired. In the case of the recipient it dealt with the passing need which, presumably, no one could have foreseen, and which it was hoped would soon disappear through the operation of economic forces, or which, if permanent, would be cared for in an elementary way by the provisions of the poor law.

Later conceptions of charity try to rationalize the giving of relief of every nature; to relate it to the life history both of the donor and of the recipient; to take into account fully the facts, both social and individual, which have resulted in the condition of need; to take into account all the important factors in the life of the recipient and not merely those lying on the surface; and to deal with present need with a view to future efficiency as well as to immediate relief. The donor also feels increasingly the need of making his benefactions square with all his other social relations. Not only must the left hand know what the right hand does, but it must be admitted frankly that one and the same mind directs both. These points of view having been met, the giving of charity in whatever form relates itself directly and in numerous aspects to the field of education. The following educational aspects of modern charity will be considered: (1) training the recipient in efficiency; (2) social work becoming a profession; (3) popular education, looking toward the removal of some of the individual causes of poverty; (4) research and agitation for legislative and administrative reforms; (5) education by conferences; (6) education by periodicals.

(1) The larger and truer view of the recipient of charity, taking into account not merely his condition of need at the moment, but his social relations and responsibilities, trying to understand his past and to safeguard his future, leads necessarily to considering whether his need is due to fault or to misfortune, and, if due to his fault, it points to an effort to revive, develop, or train whatever latent powers he may have, in order that he may become, if possible, a fully self-supporting economic unit. The educational development, especially of juvenile charges, the training of the adolescent in industry, and the development of the unused faculties on the part of the adult have become a part of all well-considered relief work.

(2) This conception of charity calls for a considerable degree of acumen and a high degree of efficiency on the part of those who are to administer it. It calls for specialization in work. Any one can pass out coins to beggars on the street, but only men of training and efficiency can so give relief as to increase the power of self-support and thus diminish the future need of relief. Until quite recently those who had been failures in some other line of work, or suffered from impaired health, or lack of tact, or want of energy, were regarded as clearly marked out for the position of almoner or relief agent. It is now evident that such persons cannot be considered competent to undertake the delicate, difficult, educational problem of modern charity. In the late eighties and the early nineties a considerable number of important charitable agencies in the larger cities began to look to the colleges and universities for trained men and women, not only as their chief executives, but also to fill the subordinate positions. At the International Congress on Philanthropy, held in Chicago in 1893, the writer presented a paper on benevolent work as a profession, calling attention to the fact that charitable and correctional activities offered an attractive field which college and university men were just beginning to appreciate. From about that time the number of well-trained men and women who chose the field of social work as a career rapidly increased. As a result the work of the agencies choosing such executives became much more vital and stimulating, attracted much more attention from the communities in which they were placed, and brought into the field of discussion and action many matters of civic, economic, social, and political interest having a direct bearing upon the condition, needs, or relief of the poor.

It had now become evident, however, that the graduate of a college or university still lacked much in the way of preparation. The Charity Organization Society of New York City led the way in a further departure, the establishment of a school for the training of social workers. This school, organized as a summer course in 1898, developed into a course extending through the usual school year in 1903-1904, and was greatly strengthened by an endowment of a quarter of a million dollars from the late John S. Kennedy in 1904, which was increased to a million dollars by a legacy from Mr. Kennedy, received in 1910.

Similar institutions have since been established in Chicago, Boston, St. Louis, and Philadelphia. The School for Social Workers in Boston was established in 1903 under the joint auspices of Harvard University and Simmons College. The Chicago School of Civics and Philanthropy, established in 1903, and the St. Louis School of Social Economy, established in 1901, are not directly connected with other educational institutions, but are carried on in each case by groups of persons closely identified with the leading agencies for social betterment. The Philadelphia Training School for Social Work was established largely by those interested in child-caring work in that city. All four of these institutions are rapidly becoming fully developed professional schools, and social work is rapidly gaining recognition as a trained profession.

(3) From the study of the best methods of relieving individuals and families, the trained social worker naturally passed on to consider the possibility of ascertaining and of restraining some, at least, of the great causes of poverty. The development of medical and social sciences has given new and most important information as to the relations of disease to poverty, and new and most valuable weapons for the conquest of disease. The first society for the prevention of tuberculosis in the United States, that in Pennsylvania, was an independent organization. The second organized effort for the prevention of tuberculosis, and perhaps the most effective and far-reaching agency of the kind in existence,

is the Committee on the Prevention of Tuberculosis appointed by the Charity Organization Society of the City of New York in 1902. The campaign for the prevention of tuberculosis in the state of New York, outside of New York City, has been carried on by the State Charities Aid Association, which was organized in 1872 for the special purpose of securing the improvement of the condition of public charitable institutions and the administration of public relief. The National Association for the Study and Prevention of Tuberculosis was composed at the outset largely of physicians, but included also a group of active and effective representatives of social work. It is generally the case throughout the United States that state and municipal campaigns for the prevention of tuberculosis are either carried on by committees appointed by charitable or relief societies, or that the active workers in independent agencies for the prevention of tuberculosis are drawn from the ranks of those who have been active in charitable work. These campaigns for the prevention of tuberculosis are, however, now primarily educational. The tuberculosis exhibition, with its accompanying publicity, popular leaflet and popular lecture is practically a new departure in popular education.

The effectiveness of the exhibition as a factor in popular education has been developed by charitable agencies more strongly than by any other group. A tenement house exhibition, organized by the Charity Organization Society, was the first step in a series of events which led to the creation of a tenement house department in the government of New York City. The State Charities Aid Association, in prosecuting its movement for the prevention of tuberculosis, has sent popular exhibitions to the county fairs throughout the state of New York, and to the State Fair. Plans are already in hand for the utilization by charitable agencies of this same form of popular education for restraining other great causes of poverty. The relation of intemperance and of immorality to disease, insanity, blindness, and other misfortunes is likely in the near future to be brought home to people generally by charitable agencies, in a manner which bids fair to be far more convincing than any other presentation of the arguments for right and simple living.

(4) In their search for the causes of poverty and in their efforts to control such causes, charitable agencies have, in a number of instances, taken the lead in informing and arousing popular sentiment as to the need of new forms of administration and in securing legislation for such changes in administration. The search for the causes of poverty, emphasizing in certain aspects the responsibility of the individual, has nevertheless done its chief service in pointing out the direct relation between certain social conditions, legislation, and adminstration and poverty. The movement to secure better legislation in the matter of employers' liability in a number of states has gained its chief impetus directly from inquiries set on foot by social workers. The Pittsburg Survey, undertaken by *Charities*, now *The Survey*, which, in turn, is a department of the Charity Organization Society of the City of New York, is probably the most widely known, as it is perhaps the most comprehensive and far-reaching effort to give a concrete description of the actual conditions of life and work in an American city, in such form as to disclose the responsibilities of the various factors in the community for conditions affecting health and life, and the directions in which municipal administration, legislation, and conscientious employers should move.

(5) The development of the professional spirit among social workers led naturally to a desire for an exchange of experiences and views, and for the discussion from time to time of problems of common interest. What is now known as the National Conference of Charities and Correction came into existence in 1874, through the agency of the American Social Science Association. The National Conference of Charities and Correction, while primarily a meeting place for the expression of opinion, and while it does not formulate platforms, nor suggest nor approve legislation, has become an educational factor of great importance. In the absence of any federal bureau or department dealing with questions of this nature, it has served to a considerable extent as a means by which active citizens in the different states have been informed in some degree as to legislation and administration in other states. It has tended to prevent excessive divergences in legislation or in policy as between different states, and has afforded at least an opportunity for advocates of varying systems to set forth their claims and to defend them. While the difficulties of securing anything like a harmonious development of social work in the different states under our federal system seem almost insurmountable, the National Conference of Charities has made a substantial contribution toward the development of a common body of knowledge and toward an interchange of experiences. More recently there has been developed in many states an annual state conference of charities and correction which, by enlisting the interest of local officials and agents of local societies, many of whom would not attend a national gathering at a considerable distance, has helped to spread the influence of the national body, to raise standards of work, to discourage easy satisfaction with traditional methods, and to make advanced legislation possible.

(6) Modern charity has to its credit the development, as part of its educational work, of a number of periodicals, several of which have merged in one, — *The Survey*, which ex-

erts a very substantial influence throughout the country. *The Charities Review*, established by the Charity Organization Society in 1891, under the editorship of Dr. John H. Finley, then secretary of the State Charities Aid Association, and now president of the City College of New York, after a period of ten years was merged in *Charities*, a weekly started by the same society, with which were subsequently merged the *Chicago Commons* and *Jewish Charities*.

It is perhaps not too much to say that in the course of the last four decades, charity, from being something incidental, irrational, unrelated to the main currents of social life, has become a thoroughly vital influence, addressing itself consciously and directly to the problems of social education and of political reform, as well as to the education of the individual.

H. F.

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PHILBRICK, JOHN DUDLEY (1818–1886). — City superintendent of schools; born at Deerfield, N.H., the 27th of May, 1818, and graduated from Dartmouth College in 1842. He was teacher in the high schools of Roxbury and Boston from 1842 to 1847 and principal of a grammar school at Quincy from 1847 to 1852. He was for two years principal of the State Normal School at New Britain, Conn., and two years state superintendent of the schools of Connecticut. In 1856 he was elected city superintendent of the schools of Boston, which position he held until 1878. He was special educational commissioner to the Vienna exposition of 1873 and director of the United States to the Paris exposition of 1878. He was also a member of the international jury of education at both these expositions. "He was the first American city superintendent of schools to win international distinction."

Mr. Philbrick's educational writings include *Truancy and Compulsory Education* (1862), *City School Systems in the United States* (1885), several addresses in the *Proceedings of the American Institute of Instruction*, articles in Buisson's *Dictionnaire de Pédagogie*, reports on the educational exhibits at Vienna in 1873 and Paris in 1878, *American Union Speaker, Primary Speaker*, and reports on the schools of Boston. For several years he was editor of the *Connecticut Common School Journal* and the *Massachusetts Teacher*. He was prominently connected with the Connecticut Teachers' Association, the American Institute of Instruction, and the National Education Association (*qq.v.*), and held offices in all these associations. His report on the *Tenure of Office of Teachers* is a valuable educational document.

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See BOSTON, CITY OF; TENURE OF TEACHERS.

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PHILIPPINE ISLANDS, EDUCATION IN THE. — Consists of islands and islets, 3141 in number, with a total area of 127,853 square miles and a population in 1910 of 8,276,802. Formerly Spanish possessions, they were ceded to America in 1898. Manila is the capital.

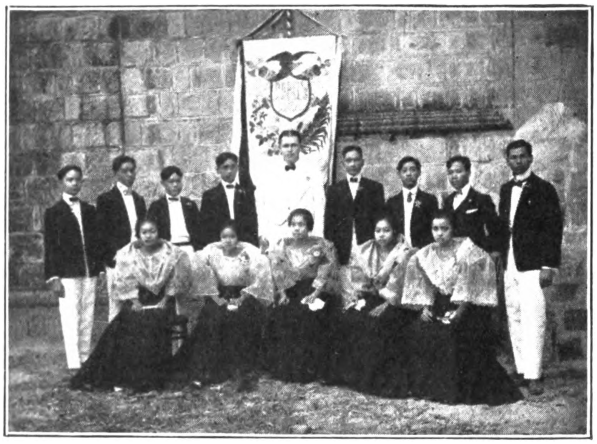
Historical. — The Filipinos were not wholly illiterate before the arrival of their Spanish conquerors. The influence of the civilization of India had extended to Malaysia and modified the culture of the primitive forest-dwelling and seagoing Malays. Syllabic systems of writing were in use in the Philippines. Chirino (*Relación de las Islas Filipinas*, 1604) states, "So given are these islanders to reading and writing that there is hardly a man, and much less a woman, that does not read and write in letters peculiar to the island of Manila." "They write upon canes or the leaves of a palm, using for a pen a point of iron." These syllabaries passed quickly out of use among the peoples Christianized by the Spanish, and no actual examples have come down to us, though the form of the syllabaries has been preserved as used by Bisaya, Tagalog, Pampango, Pangasinan, and Ilokano. Similar syllabic forms of writing are still employed by the uncivilized Mangyan of Mindoro Island and the Tagbanwa of Palawan.

Mohammedanism had also entered the southern islands of the archipelago and sent colonists to Manila Bay. The entrance of this faith meant a new source of civilization, with writing in the Arabic characters, and books of laws, genealogies, and devotion. The Moro peoples of Mindanao and the Sulu Archipelago still maintain teachers and *imans*, while the proportion who can write their Moro languages in Arabic character is surprisingly large.

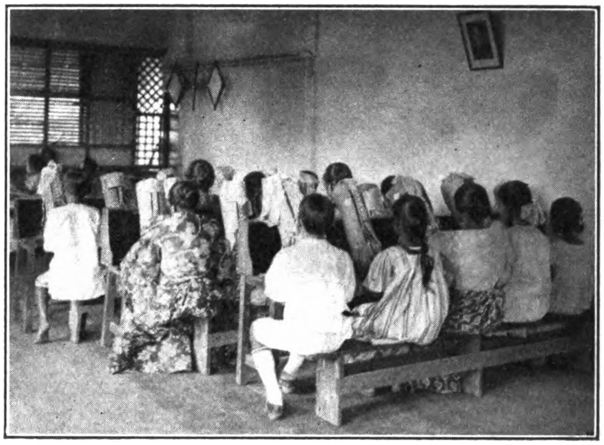
But the dominant influence in the civilization of the islands was destined to be European and Christian. The permanent occupation by Spain began with Legazpi's expedition in 1565. It was an American undertaking and it enjoyed the profit of three generations of

A Village School of the Old Type.

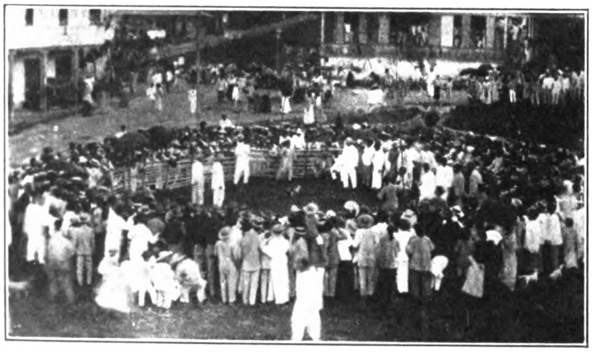
A Three-room Village School of Steel and Concrete. The New Type, Plan No. 3.



An American Supervisor with his Filipino Assistants.



Lace Making in the Primary Schools.



The Old Amusements : Cock Fighting.

Athletics under American Influence : Volley Ball.

PHILIPPINE EDUCATION.

Spanish colonization in America. The Spanish conscience had revolted against the cruelty of the West Indies; Las Casas was still living in the monastery of his order at Valladolid; and the experience of years with the American Indian was available to guide the conqueror in his efforts to subdue and civilize the Malay.

The conquest was achieved with surprising rapidity and with little conflict. The "Indians," in accordance with the system in vogue in America, were given in *encomiendas* to the Spanish soldiery. Their numbers at this time were few, probably not over 600,000 in the portions of the islands subdued. There were no large settlements and few powerful chieftains other than the sultans of Magindanao and Sulu.

The spiritual conversion of the Filipinos was for a time delayed. A few Augustinian friars went out with the first conquerors, but, after more than a decade, Governor Sande wrote that there were only thirteen friars who could say mass, and he was not sure that any understood the language of the natives. A year later arrived a company of Franciscans; two Jesuits, shortly followed by others, came with the first bishop in 1581; the Dominicans arrived in 1587, and in 1606 the Recollects or unshod Augustinians. As late as 1594 the report of a friar relates that there were no missionaries on the islands of Leyte, Negros, Bohol, Samar, Mindanao, Masbate, or many other smaller islands where the natives had been under tribute for nearly a generation, but in that year the king of Spain began to provide generously toward the sending out of missionaries, and there were soon 300 scattered among the islands, the number rising to approximately 500 in the succeeding century.

These missionary friars gathered the Indians into towns or *reducciónes*, built churches and parish houses or *conventos*, and organized the communities both civilly and religiously. By the middle of the eighteenth century they had the whole archipelago reduced to docility to Christian rite and practice, except the "Moro country," the mountain region of Northern Luzon, and the forested and mountainous interiors, inhabited by wild people.

Some attention was early given to educating the natives. The missionaries learned the divers Malayan languages spoken in the Philippines, reduced them to written form, introduced the Roman alphabet, and early established printing offices where were published catechisms, books of doctrine and devotion, and grammars and vocabularies of the native tongues. In each *convento* it was usual to conduct a native school in the dialect, taught by the sacristan or some humble dependent of the church, where boys and girls of the town were prepared for communion and perhaps learned to write their native tongues. The teaching of Spanish was not attempted until late in the Spanish régime and was opposed and condemned by the friars as likely to loosen the authority of Church and government.

Musical instruments were introduced for purposes of worship and recreation, and the astonishing aptitude of the Filipino in musical directions has made common in every village pianos, harps, violins, and the *bandúrria.* Organs are played in every church, and it is a poor town that has not a native orchestra and band.

The motives which led the Spaniards to establish secondary and high schools in the Philippines were the education of their own sons and training for the priesthood. The pioneer institution was the Colégio de San José, a college and seminary established by order of the king of Spain, opened in 1601. In 1610 it secured a bequest from the *encomiendero* of Mindanao and from this endowment supported and educated from twenty to forty students (*becas*) for many decades. In 1644 it obtained by papal brief the right to grant degrees. A royal decree of 1722 recites that "the greater part of those who to-day obtain their prebends have been reared and prosecuted their studies in San José." In 1768 on the expulsion of the Jesuits it was confiscated, then erected into a school of medicine and pharmacy. Its possession became a subject of controversy that lasted to the close of Spanish authority and was revived under the American government.

In 1619 the Dominican order founded the College of Santo Tomas, which in 1645 by papal bull was made a university. A letter of the king in 1644 stated the desire to see it possess the same qualifications as the universities of Ávila, Pamplona, Lima, and Mexico. At this period it taught grammar, rhetoric, logic, philosophy, and scholastic and moral philosophy, had about thirty secular students, and bestowed the bachelor, licenciate, master, and doctor degrees. By decree of 1785 it received the title of "Real" and became known as the "Royal and Pontifical University of Saint Thomas Aquinas." The teaching of civil and canon law was added in the eighteenth century, and in 1875 courses in medicine and pharmacy. The "Moret Decree" in 1870 attempted to secularize this institution and bring it under government control as the "University of the Philippines," but the opposition of the Church prevented the enforcement of the decree. Since the American occupation it has reorganized and amplified its courses and is attended by large numbers of Filipino students, especially those seeking a training in law.

A number of other secondary schools, including *beaterios* for orphan girls, existed from an early date. The Colégio de San Juan de Letran, established about 1640 as a school for orphan boys, developed into a secondary school and, in charge of the Dominicans, became a preparatory school to the University. It still exists and is largely attended.

At the beginning, these and similar institutions were not open to Filipinos, but during the eighteenth century the practice grew of ordaining native curates, and this opened the way for Filipino education. In 1800 five "conciliar seminaries," one for each diocese, were opened to train native priests, and in 1862 they were placed in charge of the Paulist Fathers. The instruction at these seminaries was not adequate to prepare a trained clergy, and the curates became subject to harsh depreciation, especially after the opening of the Suez Canal (1869), when the numbers of the regular orders increased and antagonism developed between these Spanish missionaries and the Filipino priests (*clérigos*).

Up to and past the middle of the nineteenth century, education remained wholly in the hands of the Church, and while the mass of Filipinos received instruction in the parishes in doctrine and catechism, there were practically no educated Filipinos outside of the clergy. In spite of repeated decrees of the king enjoining the use and teaching of Spanish, this language had made no progress among the natives. Travelers in the islands up to 1870 are unanimous that the Filipinos able to speak the Spanish tongue were rarely met.

Meanwhile the increase of commerce, due to the opening of the archipelago and the production of hemp, sugar, and tobacco, largely in the hands of native families of local prominence, had produced a Filipino aristocracy with wealth and ambition. Knowledge of Spanish was a great distinction, and education for their sons was eagerly sought by men of means.

About 1862 began a movement of young men abroad for study. This practice continued, many being driven to study abroad because of the obstacles presented in the Philippines and the danger of being marked as a separatist or *filibustero*. At the end of Spanish rule some hundreds of young Filipinos had roamed the countries of Europe gratifying their curiosity and their thirst for knowledge. Many of these young men bore dramatic parts in the period of Revolution.

The education of the Filipino was greatly advanced by the return in 1859 of the Jesuits. In 1866 they established the Ateneo Municipal, a secondary school supported by the city of Manila, reorganized since the American occupation as a private college. In 1863 the Spanish government resolved to establish a system of public instruction. It was an important step in the Spanish program to reform and modernize the Philippine administration. The important decree of December 20, 1863, was issued by the colonial minister, José de la Concha. It decreed a normal school in Manila under the Jesuits; a school of primary instruction for boys and one for girls in each town of the islands, the instruction to be gratuitous and attendance obligatory; expenses of the schools to be charged on the local budgets; school teachers to be exempt from the personal service tax and after five years' service to become "*principales*" or local aristocrats. Government clerical positions were to be filled by preference from the ranks of experienced teachers; a Superior Commission of Primary Instruction was to consist of the Civil Governor of the islands, the Archbishop of Manila, and seven others; the parish priests were to be "local inspectors" and direct instruction in Christian doctrine and morals. Fifty years ago so comprehensive a scheme of native enlightenment was more of a novelty in colonial administration than it would be to-day. Despite the defects and limitations of the plan, it must take place as a pioneer scheme in the modern education of backward peoples.

The plan thus inaugurated found slow realization; nevertheless, at the close of Spanish rule some 2100 schools were reported to be in operation, and most towns had buildings for boys and for girls. The teaching, however, was far from satisfactory, the methods poor, and the instruction was usually confined to the native dialect of the locality. In spite of these drawbacks, it is surprising how considerable a number of natives gained at least a slight knowledge of Spanish and the rudiments of education. Such was the educational situation when, in 1898, the Philippines passed from the sovereignty of Spain to the United States.

Present System. — The American army occupied Manila August 13, 1898, and on September 1 the public schools of the city were reopened. Little attempt was made at first to change the teaching or discipline, but American teachers were engaged to commence instruction in English. A year later, as the occupation of the islands advanced, schools were opened generally, army officers were charged with their oversight, and teaching of English was begun by enlisted men. Probably a thousand schools were in this way conducted by the army, even during the period of warfare. The Military Governor urged on the school work as a measure "calculated to pacify the people and to procure and expedite the restoration of tranquillity." These highly commendable efforts opened the way for the educational work established by the Philippine Commission.

The above Commission, under instructions from President McKinley to organize a civil government for the archipelago, reached the Philippines in June, 1900, and commenced its labors as a legislative body on September 1. Before reaching the islands, it engaged Dr. Fred W. Atkinson of Springfield, Mass., as a general superintendent of education. A broad survey of the educational needs was made, qualified soldiers discharged from the volunteers were engaged as teachers, and new schools were opened with the coöperation of army officers.

On January 21, 1901, the Commission enacted an organic school law (Act 74, subsequently amended by act 477 and other acts) which centralized the administration of all public schools in a Bureau of Education. It was provided that instruction should be free and secular, that the English language should be the basis of instruction, that religious instruction might be given in public schools on certain days by priests or other qualified persons but not by teachers. The education of both sexes together, while not provided for by law, was assumed. A normal school and a trade school were authorized. Authority was given to the General Superintendent to engage 1000 American teachers and bring them to the islands, assigning them to towns where conditions were most favorable. These teachers were promptly secured, and by October, 1901, 765 were at work in nearly all parts of the islands. In 1902 the number increased to 926, the largest number ever at once in the field. This pioneer work was greatly embarrassed by difficulties of communication, disturbances due to bandits or *ladrónes*, the disorganization of local government, upon which the maintenance of primary schools depended, and especially by a severe epidemic of cholera which swept over the archipelago in 1902–1903. In spite of extreme disadvantages, some 2000 schools were conducted, the naturalization of the English language was begun, and a considerable number of promising young people were brought under the personal influence of high-minded American teachers. These young natives were the nucleus of the new clerical and teaching force indispensable to the purposes of the government. Night schools for adults were early established in Manila and, proving popular, night classes were authorized and conducted by American teachers in many towns. They were gradually discontinued after 1904, except in Manila.

The first work was of a primary character, the aim being to lay a broad basis for popular enlightenment. But the demand for higher instruction in English was soon felt, and by Act 372 (March 6, 1902) secondary schools were authorized to give normal training, agriculture, and manual training, besides academic and commercial instruction.

At the end of 1902 Professor Bernard Moses, first Secretary of Public Instruction and Philippine Commissioner, resigned and was succeeded by General J. F. Smith. Dr. Atkinson resigned at the same time, and was succeeded by Dr. E. E. Bryan, Superintendent of the Normal School. He was followed in August, 1903, by Dr. D. P. Barrows, who had been for two years Chief of the Ethnological Survey. Dr. Barrows continued at the head of school work until November, 1909, when he was succeeded by Mr. Frank R. White, who had entered the teaching service in 1901.

During 1903 and 1904 improved conditions made possible a rapid building up of school work and considerable improvement in administration. The administration is highly centralized. The Director of Education (formerly General Superintendent) appoints and promotes superintendents and teachers, prescribes the courses of study, authorizes the opening of new schools, selects and purchases all textbooks and supplies, which are furnished free to public school pupils, and approves building plans. The Director is responsible to the Secretary of Public Instruction, who is a member of the Commission and who has in his department five other bureaus besides Education. The number of division superintendents originally provided (ten) was inadequate, and the number was increased until one was appointed for each province. The provinces were divided into some 400 "districts," and an American teacher was designated as "supervisor" of each. Under these active men new primary schools were established, and many young Filipino teachers engaged and set to work. The aim was to extend the public school advantages to the people of the "barrios." This aim has been kept constantly in view and has been nearly realized.

The expenses of all instruction are divided between the insular, provincial, and municipal governments, the expenditures for 1911 being $1,765,958, $104,643, and $1,258,230, respectively, a total of $3,128,831.

Elementary Education. — In the school year ending March, 1909, 4194 primary schools were conducted and attended by no less than 570,502 pupils, about two fifths being girls. In 1904 the complete program of studies was issued. It represents a departure from American school curricula. It provides for three sorts of public schools: primary, 3 years (extended to four years in 1906); intermediate, three years; and secondary, four years. The subjects taught in the primary schools are reading, language, arithmetic, geography, hygiene and sanitation, municipal government, music, drawing, and industrial work. All instruction is in English, and all teaching at the present time in primary schools is done by Filipino teachers. Industrial teaching has received much emphasis. The Filipino is a deft and artistic worker. The varied and useful native manufactures, such as basketry, mat and hat braiding, were selected in 1904 for teaching in primary schools. Loom weaving, lace working, and embroidery have been added, and by the diffusion of these arts remunerative household occupations are being created and extended. Gardening is also taught as a primary school subject, and thereby new vegetables and food plants are introduced into many parts of the islands. Since 1909, industrial teaching has been standardized, and nearly 400,000 pupils are now engaged in some sort of industrial work. The primary and intermediate textbooks have been written especially for Philippine schools and are models of good methods and of the publisher's art.

The intermediate schools were from the first vocational as well as academic. Six specialized intermediate courses were fixed upon in 1909; namely, general, teaching, farming, tool work, business, and housekeeping and household arts. There were 245 intermediate schools in 1911 attended by 25,000 pupils.

Secondary Education. — Secondary schools in 1904 were limited to one for each province. Comprehensive plans were framed for their development and the aid of provincial governments was secured for obtaining lands and buildings. These schools have become the intellectual centers of the provinces, and many possess large tracts of land for athletics and for farming, and groups of buildings including shops, domestic science buildings, and dormitories.

Attendance at all schools is voluntary. Compulsory attendance, though frequently urged, has never been authorized by law.

The school system is closely coördinated with the public service, and the examinations given by the Civil Service Bureau are taken by hundreds of intermediate and high school graduates who thereby become eligible for public appointment. The Bureau of Education has also provided courses of training for producing skilled assistants in several branches of the Government: nurses for the Bureau of Health, apprentice surveyors for the Bureau of Lands, and rangers for the Bureau of Forestry, besides training clerks, stenographers, and a teaching force of over 8000 men and women.

In 1903 the Government provided a plan of sending selected students to the United States. Some 209 have been appointed, usually for four years, but the plan has been discontinued, as University facilities have been provided in the Philippines.

Schoolhouses. — The rapid growth of the system of schools made necessary the use of hundreds of rude schoolhouses of native construction, but notable progress is now being made in erecting permanent school buildings of concrete. The first Philippine legislature, on its organization in 1907, passed, as its first act, a bill providing $500,000 for barrio school buildings. It has since duplicated this sum. There have been other important insular appropriations for school buildings and numerous private donations.

Athletics. — A most important part of school work is athletics. American sports are coming to exert great physical and moral influence. Field meets are held in all provinces, and there are four interprovincial meets, besides the insular meet at the annual carnival in Manila. In 1911, 482 competing baseball teams played 1201 official games, while a single province had 110 organized school teams. Basket ball is played by girls.

Teachers. — From the beginning great attention has been given to training the native teacher, without whom education must have continued on narrow lines and without a permanent foothold. This is accomplished by "training classes" conducted by the supervisors for their corps of primary teachers, by "vacation normal schools" held in each province for four weeks each year, and by "vacation assemblies" at Manila and a few other important places. Correspondence courses for teachers are conducted by the central office of the bureau. All native teachers are carefully graded in respect to attainments, and encouraged to keep constantly advancing.

The American teachers, who now amount to over 700, come from all parts of the United States. Those first appointed in 1901–1902 were selected by the General Superintendent without examination test. In 1903 some 125 were selected, under authority of the Civil Governor, by the Catholic Church in the United States. Since that date all appointments have been under the civil service of the islands, and eligibility is obtainable only by passing examinations. There is an agent in the United States for meeting prospective teachers, and the Bureau of Insular Affairs at Washington gives assistance. Each year an average of 100 new teachers, mostly men, are appointed. A vacation assembly for American teachers was established at Baguio, the summer capital, in 1908. The region is a cool, elevated plateau covered with pines. Courses are given by lecturers from American Universities and conferences on school work are held.

Special Schools. — There are several "insular schools." The Normal School at Manila provides an advanced course for training teachers and, previous to the opening of the university, prepared pupils for college, medical studies, and study of the law. The trade school at Manila is equipped for teaching mechanical drawing, woodwork, machine shop, motor repair, wheelwrighting, wood carving, ceramics, textiles, and minor industries. In addition to this central trade school, each provincial secondary school has woodworking shops and a mechanical drawing department, while several have machine shops also. Altogether 358 manual training shops in the schools are reported. In Manila are also a higher School of Commerce and the School for the Deaf and Blind. The Nautical School inherited from the Spanish régime was closed in 1907.

Results. — The results of this wide attempt at education are becoming manifest. English is spoken by young people and children in practically every village, and the door to useful and enlightened life has been opened to thousands of young men and women. The Bureau aims to abolish illiteracy and give the entire population the basis of an education. If the present efforts are sustained, this end will be nearly attained for the youthful population in the course of another decade.

The school effort among non-Christian peoples, numbering about one million, is not as extensive, but significant results have been secured. Central schools, with provision for boarding pupils, are placed at the largest centers of the pagan population and an industrial and literary education is given. Such are the Igorot schools in the Mountain Province of Luzon, schools for Ifugao and Ibilao in Nueva Vizcaya, for the Bukidnon and Manobo on the Island of Mindanao and for the Tagbanwa of Palawan. Over 12,000 pagan children are being thus educated.

The schools of the Moro Province are not under the Bureau of Education, but are conducted by a superintendent who is an official of that government. Mohammedan prejudice and opposition have hindered the development of schools among these peoples, but some sixty schools are conducted, including a secondary school at Samboanga.

Higher Education. — The Philippine Legislature by Act of June 18, 1908, established the University of the Philippines. It is a corporation composed of six *ex officio* and five appointed members called "regents." The following colleges have been established: Medicine, organized in 1906, Liberal Arts, Agriculture, Veterinary Science, Engineering, Law, and Fine Arts. The College of Agriculture is located at Los Baños, Laguna Province; the other colleges are at Manila. These colleges, except Fine Arts, receive only graduates of high or secondary schools. The College of Liberal Arts is divided into the junior college, bachelor degree, two years, and senior college, master degree, three additional years. The other University courses are from three to five years' duration. The six colleges were attended during the school year 1911–1912 by 599 students, the School of Fine Arts by 801 students.

The freedom of instruction made possible by American sovereignty has resulted in a large increase in private institutions and the general prosperity of such schools. In 1902 the Liceo de Manila was established, almost the first Philippine secondary school under secular management. Many of the provincial towns now have private secondary schools. Until recently their courses of study were modeled after that of San Juan de Letran, the Ateneo, or other Spanish schools, and embraced no more than five years, following the primary school of three or four years. The bachelor's degree was conferred. The desirability of raising the standard of secondary work in all these institutions being clear, the Secretary of Public Instruction began in 1908 to urge such reforms, promising therefor government recognition of their degrees. In 1910 a special examiner was appointed. All together seven institutions, not including Santo Tomas, have had their bachelor degrees recognized. These are Ateneo, San Juan de Letran, San Beda, Assumption College (women) in Manila, Silliman Institute at Dumaguete, San Vicente de Ferrer, near Iloilo, and the Colegio Seminario at Bigan, Ilokos Sur. D. P. B.

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PHILIPPINES, UNIVERSITY OF, MANILA. — See Philippines, Education in.

PHILLIPS ACADEMY, ANDOVER, MASS. — Founded in 1778 by Samuel Phillips (*q.v.*), then Lieutenant Governor of the commonwealth. It was designed to prepare boys for the higher institutions and to fit them for the largest civic usefulness. The school, which was founded on broad democratic lines, early acquired a national reputation and prestige. It was visited by President Washington, who later sent nine of his nephews and grandnephews to enjoy its benefits. The Academy was incorporated in the last act of the "Great and General Court" just prior to the formation of the new state government. Phillips Academy has grown steadily in numbers, in material equipment, in efficiency and influence. Its enrollment in 1911–1912 was 571 boys. Its equipment consists of 35 buildings. Its faculty numbers thirty-three men. Its students come from practically every state in the Union, and from many foreign countries, and its graduates are accustomed to enter annually a score or more of the higher institutions of learning. The school prides itself on its democracy, boys who are compelled to work their way mingling and competing on equal terms with those of generous wealth.

PHILLIPS ACADEMY, EXETER, N. H. — Founded in 1781 by John Phillips (*q.v.*), the chief benefactor of the institution for the purpose of "promoting Piety and Virtue, and for the education of Youth, etc." William

Woodbridge (*q.v.*) was the first principal. Instruction is offered in all the studies required for admission to the leading colleges and scientific schools. By the constitution of John Phillips the academy is "equally open to youth of requisite qualifications from every quarter." The school enjoys a great reputation throughout the country and trains students from all parts of the Union. The students are divided into four classes or years. The enrollment in 1911–1912 was 522, and the faculty consisted of twenty-six members. The equipment has been gradually augmented, more particularly since 1883. The students are distributed in a number of dormitories, and throughout their stay in the school are under the charge of advisers whom they consult on matters relating to studies and school life.

PHILLIPS, JOHN (1719–1795).—Founder of Phillips Academy at Exeter; born at Andover. He graduated from Harvard University in 1735 and for a time taught school. He had some idea of entering the ministry, but decided finally on a mercantile career at Exeter. When his nephew, Samuel Phillips (*q.v.*), founded Phillips Academy at Andover (*q.v.*), he contributed to its endowment. Probably influenced by his nephew, he founded Phillips Academy at Exeter in 1783, of which he was the chief benefactor. Phillips was for twenty years a trustee of Dartmouth College, where he endowed a professorship, and was also interested in Princeton College, to which he made some donations.

See ACADEMY.

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PHILLIPS, SAMUEL (1752–1802).—Founder of Phillips Academy at Andover (*q.v.*); born at Andover. He was educated at Dummer Academy and Harvard University, where he graduated in 1771. Two years later he became town clerk and treasurer of Andover. From 1775 to 1779 he was a member of the Provincial Congress, and later of the senate, of which he was president in 1785. In 1801 he was lieutenant governor. From 1782 to 1798 he was judge of the common pleas in Essex County. He was greatly interested in education, was an overseer of Harvard University, and frequently visited the Andover common schools. He was the founder in 1777 of Phillips Academy (*q.v.*) in his native town and was largely instrumental in securing its endowment. See ACADEMY.

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PHILO JUDÆUS (20 B.C.–*c.* 40 A.D.).—Hebrew philosopher, a native of Alexandria, Egypt.—See NEO-PLATONISM; MYSTICISM; also JEWISH EDUCATION.

PHILOLOGY. — The meaning of the term philology has been different at various times. Historically there are three main periods in which philological studies have flourished, (*a*) the Classical, (*b*) the Renaissance, and (*c*) the Modern period.

Classical Period. — The earliest use of the word φιλολογία is found in Plato, where it has the meaning "lover of dialectic," or "of scientific argument." The corresponding adjective, φιλόλογος, bears the sense of "lover of discourse" in contrast to μισόλογος, "hater of discourse." The former adjective is used of Athens as a city "fond of conversation," as opposed to Sparta and Crete, according to tradition places where brevity of speech was more highly regarded (Sandys, Vol. I, p. 4; cf. Acts XVII, 21). In general use, however, the word bore a broad significance, both in Greek and in the Latin uses of the word which the Romans derived from the Greeks. In Cicero's letters the word *philologus* means merely "learned" or "literary." In the post-classic poem of Martianus Capella, *De Nuptiis Philologiæ et Mercurii*, Jupiter at a meeting of the gods demands the rights of naturalization for one who has hitherto been only a mortal virgin, *i.e.* Philology, the bride of Mercury, who represents wisdom or knowledge. Philology is the goddess of speech or expression, and she is attended by seven bridesmaids, who are none other than the seven divisions of the quadrivium and trivium. The conception of philology which the poem presents is therefore that of systematic learning and its expression in speech or writing. From these uses of the term, it is apparent that *philologus* in Latin and in Greek was a word of both wider and less definite significance than it is in modern usage.

For other and more special aspects of the activity of the philological student, according to the modern understanding of the term, the Greeks and Romans employed two other terms, *γραμματικός, grammaticus,* and *κριτικός, criticus.* The first of these terms was used chiefly in the Alexandrian period, and like philology, its meaning was broad. It signified generally "student of literature," particularly poetic literature. The kind of study implied by the term is indicated in the six divisions of the subject given by Dionysius Thrax (*c.* 166 B.C.), in "the earliest treatise on grammar now extant" (Sandys, Vol. I, p. 8). These six parts are (1) accurate reading; (2) explanation of poetic figures of speech; (3) exposition of rare words and of subject matter; (4) etymology; (5) statement of regular grammatical forms; (6) the criticism of poetry. By criticism is meant the attempt to detect spurious passages or spurious works. The grammarian was one, therefore, who busied himself with the study, the editing, as it would be called in modern times, and the interpretation of poetry. Criticism was the highest function of the grammarian. There were special reasons why the study of grammar and criticism (*i.e.* "the higher criticism") should be cultivated in the Alexandrian period. The work of the Alexandrian scholar consisted mainly in the classification of works, the determination of their authorship, the establishment of pure texts, the study of grammar in the narrower sense in order to determine the relative authority of different manuscript readings, and matters similar to these. A typical Alexandrian scholar was Eratosthenes (*c.* 276–*c.* 196 B.C.), a versatile man, and the first of the Alexandrians to assume the name φιλόλογος. He wrote treatises on geography, mathematics, astronomy, and chronology. His greatest work was one on the Old Attic Comedy περὶ τῆς ἀρχαίας κωμῳδίας, really a series of monographs on questions of authorship, date, textual criticism, language, etc., in the plays. But he was also a man of literary taste, and himself wrote poems and philosophical prose treatises. On the whole, the Alexandrian conception of philology may be defined as a combination of scholarship and literary versatility.

Besides the three groups of linguistic students represented by the *philologus*, the *grammaticus*, and the *criticus*, in classical times, notice must also be taken of the *philosophus* and of his attitude towards speech and language. The *philosophus* differed from the other three in that he sought for first principles, for the explanations of things, whereas the *philologus*, *grammaticus*, and *criticus* were concerned with specific pieces of literature or with individual phenomena of language. In his search for first causes, the *philosophus* was naturally brought to consider the nature of speech, its origin, and the relation of speech to thought and to the world of concrete objects. These questions were considered by the early Greek philosophers in great detail, some of Plato's most careful thought being given to them. In many respects the linguistic speculations of the philosophers entered the special province of the philologists, as, for example, the philosophers' study of etymology in the endeavor to determine the true meanings of words.

From this brief survey, it will be seen that the classical period never arrived at any unified or, on the whole, any very profound conception of the philological study of language and literature. It attempted to some extent to answer philosophically the question of the origin and nature of language, to interpret and correct the body of its traditional literature, and to a more considerable extent to work out a system of grammatical classification and nomenclature. There was, however, no sense of the homogeneity of linguistic and literary studies and there was but slight sense of historical growth and development. On the side of attainment, encyclopedic learning was the ideal. Modern scholarship, in the development of a theory of philology, does not build therefore upon a classical basis. Classical thought on matters linguistic is not introductory to the modern science, but is more important for logic and philosophy than it is for linguistics. The most important linguistic inheritance of the modern period from classical times is to be found in the classifications and terminology of descriptive grammar. These have come down from Plato and Aristotle and the classic grammarians in unbroken transmission.

Medieval and Renaissance Periods. — The neglect of classical literature in the medieval period implied the decadence of classical scholarship and philology. The extent of this neglect and decay may be inferred from the fact that knowledge of the classic idiom of Latin (and still more of Greek) was so imperfect as to give rise to a new form of the language so different from classic Latin as to require a new name for itself, — middle or medieval Latin. (See MIDDLE AGES, EDUCATION IN). The medieval period was not curious about philosophical or psychological questions concerned with language. It accepted mainly the story of the creation of language by Adam, and hampered by the flat chronology which prevailed, and lacking any clear sense of historical perspective, it was naturally not concerned with questions of change and development. The medieval period was incapable of adding anything to classical theories of the study of language and literature. At its best it was conservative, and even this function was very inadequately performed. A typical scholar of the best type in the medieval period was the English monk, Bede (*q.v.*). His study of language specifically was entirely practical, and he developed a free, clear, and harmonious Latin style which enables one to read his works with pleasure.

The Renaissance conception of philology is closely bound up with the general movements in thought and culture which deeply affected the life of Europe in the fourteenth and several succeeding centuries. The scholarship of this time was largely a revolt against scholasticism, with its exaggerated sense of the importance of dialectic in all matters concerned with the intellectual life. The Renaissance may be regarded mainly as a humanistic movement, and the study of literature was approached from the æsthetic rather than the intellectual side. Of great importance in the development of Renaissance humanistic studies was the restoration of Greek to its proper place as a learned language, and also the development of a feeling for the purity of classical Latin idiom and a respect for it which was unknown to the medieval world. Language was studied, however, almost exclusively as an approach to literature. The philosophy of the Renaissance linguists never concerned itself with any questions deeper than that of the relation of a learned to a popular language, as in Dante's *De vulgari eloquio,* and with the consequent question, how a popular language can be elevated to a position on a level with the learned languages. Language and grammar were regarded as handmaidens to literature, and the main purposes of the study of literature were partly higher criticism and partly appreciation but, most of all, imitation. Excellence in literature was to be attained by the imitation of classic models, and the first thing necessary was naturally a knowledge of classic types of literary art. As aids in attaining this knowledge, the Renaissance scholar gave much attention to the writing of grammars, dictionaries, and helps to composition. His persistence and enthusiasm have been effectively and truly presented in Browning's poem, *The Grammarian's Funeral.* So great was the respect which the Renaissance student felt for the classics that language alone was often regarded as sufficient to make a humanist. It was enough, many humanists thought, if one imitated exactly the language of Vergil, or Ovid, or above all, Cicero, regarded by almost universal consent in the Renaissance as the perfect model of eloquence. (See CICERONIANISM.) Nevertheless the scholarship of the Renaissance, though sometimes narrow and pedantic, in the hands of its best representatives was enlightened and astonishingly comprehensive. Among typical scholars may be mentioned the Frenchman Budé, or Budaeus (1468–1540), who speaks of philology as his *altera conjux,* and who also declares that he was the first to call himself a philologian (see Delaruelle, *Budé,* p. 215). Another famous Renaissance scholar was Joseph Justus Scaliger (*q.v.*), whose learning and productivity are indeed occasions for wonder. But the modern student is likely to feel with respect to Scaliger and with respect to Renaissance scholarship in general, that it is disorganized and often smothered under its own accumulation of detail.

Modern Period. — With the modern development in scholarship, attempts have been made to organize a system of philological study as clearly defined as are modern botany, biology, and astronomy. The beginnings of this movement, which has resulted in the formation of the theory of the science of philology, with clear delimitations of subject matter and of method, were in large measure, like the beginnings of Renaissance scholarship, a protest against the intellectualism of a preceding period. In Germany, where philology was earliest cultivated in modern times, it was at first closely connected with the neo-humanism and romanticism of the latter half of the eighteenth century, which in turn were largely a reaction against the preceding and contemporary philosophy of the enlightenment (*q.v.*), with its contented but somewhat narrow *Aufklärung* of the field of human thought. The general philological movement was at first humanistic in that it turned aside from philosophical and rational systems, and attempted to restore past civilizations. It was a study of culture. Later, under the influence of natural sciences, of the historical method, of Darwinian theories of evolution, and of similar developments of modern thought, philology tended to take a broader aspect than that of humanistic study only. There were thus developed the psychological, social, and historical aspects of the modern science of philology. Modern philology may be most fitly regarded as beginning with Friedrich August Wolf (*q.v.*). The first modern to call himself a philologist, Wolf, described himself in the matriculation book of the University of Göttingen, under date of April 8, 1777, as *studiosus philologiæ.* As student and later as teacher of philology, Wolf defines his subject compactly but broadly as the biography of a nation. The purpose of it was to reconstruct all the life of a past period which can be recovered from records. These records include of course not only language, but all other forms of recorded knowledge or experience. Wolf's other name for philology was *Alterthumswissenschaft,* the science of antiquity. But by antiquity Wolf means only Greek and Roman antiquity. The term is so limited for various reasons, *e.g.* because these peoples only have left abundant records of their life, because of the importance of the civilization of the Greeks and Romans for modern civilization, etc. But the general theory of philology, as the biography of a nation, does not imply a limitation to the Greek and Latin peoples, and if circumstances permitted, a Hebrew, an Egyptian, and other philologies would be possible. The aim of philology should always be, however, in Wolf's conception, the synthetic presentation of the whole life of a people at a definite period. Wolf was thus interested in language, literature, art, etc., in themselves only as each contributes its share to the unified picture of the life he was attempting to reconstruct. Philology thus becomes, in his mind, the recalling to life of historical Greek and Latin civilization, and it presents an organic conception of the subject lacking in classical and Renaissance scholarly investigation. In the carrying out of this scheme, Wolf makes the following divisions of the subject in his *Fundamentaltheile der Alterthumswissenschaft* (*Vorlesungen,* Inhalt, p. v ff.):

(1) Grammar, or the study of language (merely, however, for the practical purpose of acquiring ability to read texts).

(2) Hermeneutics, " Erklärungskunst," defined as

the art of "comprehending the ideas of another just as he would have them comprehended." (*Vorlesungen*, I, 271.)

(3) Criticism, the rules by which we determine the age, the genuineness, or the authorship of works, the correctness or incorrectness of words, of passages, etc.

(4) The geography of antiquity.

(5) The political history of antiquity.

(6) *Antiquitates*, "Alterthümer," by which Wolf means allusions to ancient customs, beliefs, and practices.

(7) Mythology.

(8) Literature, sciences, and arts among the Greeks and Romans.

(9) History of Art, *i.e.* the study of the works of art of the ancients, including archæology, numismatics, epigraphy, architecture, sculpture, and painting.

It will be seen at once that Wolf was a system builder, and so also were his immediate successors in the development of the theory of philological studies. August Boeckh, who lectured on the methodology of philology from 1809 to 1865, proceeded on the basis of Wolf's definitions. His is the broadest possible conception of philology: "die eigentliche Aufgabe der Philologie das Erkennen des vom menschlichen Geist Producirten, d. h., des Erkannten" (*Encyk.* p. 10), which translated reads, "the real task of Philology is the restoring to knowledge of that which has been matter of knowledge." The subject is again defined as "die Nachconstruction der Constructionen des menschlichen Geistes in ihrer Gesammtheit" (*Encyk.* p. 16), "the putting together again in its entirety of all that the human spirit has fashioned". Wolf had made philology the reconstruction of the past culture and life of a nation, more specifically of the Greek and Roman nations. Boeckh extends the definition to include the reconstruction of the culture and life of all past existence, so far as that existence may be made known through the records it has left behind. Philology according to this conception comprises all history in the narrow sense of narrative, institutional and social history, all historical linguistics, literature, art, science, etc. It excludes philosophy in so far as philosophy is concerned with first causes, not with the content, meaning, and value of records of thought; it excludes also science in the sense that investigational science endeavors to determine the immediate and the actual, although when science becomes historical and concerns itself with man's activity and self-expression in the past, as, for example in the science of folklore, it falls within the limits of Boeckh's definition. The necessity of subdivision of the great subject is acknowledged by Boeckh, but the theoretical definition is defended on the ground that no science is completely realizable, *e.g.* the biologist theoretically sets himself the unattainable goal of knowing all about all animal life, and the chemist cannot exhaust all the possibilities of combination among natural elements. It may be pointed out that Boeckh adds to Wolf's conception of philology also in that he assigns a higher place to linguistics, which he would study not only to gain a practical reading knowledge of language, but he would have languages considered in themselves as expressions of the life of the people who develop them.

The difficulties in the way of any practical realization of this general scheme of philology are in certain respects obvious. Any valid criticism of Wolf's theory would apply as well, but with more weight, to Boeckh's theory. Two main difficulties may be noted: (1) the student who would carry out Wolf's or Boeckh's scheme must possess combined qualities, *i.e.* the critical faculty for the gathering and preparation of his material, and second the constructive and artistic for its composition. The qualities of mind required by the first half of the task are memory, critical judgment, sense of order, "learning" in the specific sense. The qualities of mind required by the second half of the task are constructive imagination, a sense of the relative importance of parts, and the poetic faculty which gives life to an assemblage of facts. The two groups of characteristics are not necessarily mutually exclusive, — witness Jacob Grimm and Sir Walter Scott, — but actually they are not often found in combination. "As a rule, one has dwarfed the other; either the creative fancy, scorning a solid masonry of facts, builds its castles in Spain without carpenter and architect, or a hesitating exactness may become the fetish to which the children of the imagination are sacrificed" (Oertel, *Lectures*, p. 20). The second fundamental difficulty which obstructs the path of the philologist of Wolf or Boeckh's way of thinking is the vast extent of inherently heterogeneous subject matter which he must command and assimilate. The specialist is necessary for the preparation of the material, but the specialist is manifestly incapable of spreading himself over the whole field. The nearest approach to a realization of the synthetic idea is to be found in the *Grundriss* plan of collaboration, various scholars of supposedly the same general point of view taking each his special part in a harmoniously elaborated scheme of presentation. Thus Paul, *Grundriss* I, 1, joins himself to the school of Boeckh when he expresses the conviction that "die Einzelnen Gebiete in welche man das Kulturleben eines Volkes zu zerlegen pflegt, in der wissenschaftlichen Untersuchung nicht isoliert werden dürfen." And he also extends Boeckh's formula, "das Erkennen des Erkannten," in that he insists that the philologist must not only know again what was in the clear consciousness of individuals in past times, but also must be able to see into forces and streams of tendency which were not clearly perceived; he must see relations of cause and effect, and follow out lines of historical development. In practice Paul's *Grundriss* is the fullest attempt made to realize the broad conception of a philology of the Germanic peoples. This work was planned and executed under the general supervision of Hermann Paul, assisted by special students, such as Sievers, Kluge, Noreen, Wright, Brandl, Luick, R. Kögel, and others. The work as it was finally executed consists of fifteen parts, not indeed arranged in any strictly systematic method so as to give a philosophically unified interpretation of Germanic civilization. The various parts are as follows: (1) the meaning and purpose of Germanic philology, a theoretical discussion and definition of the subject by Paul; (2) history of Germanic philology, also by Paul; (3) methods of Germanic philology by Paul; (4) history of Germanic alphabets and of writing by Sievers and Arndt; (5) *Sprachgeschichte*, the history of the various Germanic languages, by different scholars; (6) *Literaturgeschichte*, the history of the various Germanic literatures, each treated separately, as the languages are, by a specialist; (7) historical and theoretical discussion of Germanic meter; (8) ethnography (Bremer); (9) *Wirthschaft*, *i.e.* the practical arts of agriculture, etc.; (10) *Recht*, *i.e.* law and legal custom; (11) *Kriegswesen*, war and its traditions; (12) Mythology; (13) *Heldensage*, *i.e.* heroic traditions; (14) *Sitte*, *i.e.* social custom and formalities; (15) *Kunst*, (*a*) *bildende Kunst*, painting, architecture, and sculpture, (*b*) music.

Specialized Use. — Although the broad philosophic definition of philology as elaborated by the theorizers of the school of Wolf and Boeckh will be generally accepted by philological students as true to the underlying purpose and methods of their investigations, popularly the subject is more narrowly conceived as equivalent to linguistics. "Philology," says the *Encyclopedia Britannica*, "is the generally accepted comprehensive name for the study of the word; it designates that branch of knowledge which deals with human speech, and with all that speech discloses as to the nature and history of man." Two main definitions are given in the *New English Dictionary:* (1) "Love of learning and literature; the study of literature in a wide sense, including grammar, literary criticism and interpretation, the relation of literature and written records to history, etc.; literary or classical scholarship; polite learning. Now *rare* in *general* sense"; (2) a special sense, the usual one in modern use, "the study of the structure and development of language; the science of language; linguistics." The second sense is really one branch of the first, which represents in some respects the classical conception of philology, with additions from the broad synthetic definitions of the Wolfian school.

These narrow popular conceptions of philology are to some extent forced upon the serious student by the practical exigencies of subject matter. Obviously the Wolf-Boeckh theory, though valuable as an ideal from which to draw inspiration, is not one to be applied in detailed practice. Perhaps the definition which most nearly describes the actual work of philologists might run as follows: Philology is the study of culture as it is recorded in language. This definition implies that language itself is an object of study for itself, since it is one of the expressions of the cultural development of the people that employ it. It implies also that the study of literature is a branch of philology when such study is concerned with the interpretation of the text of literary monuments, and with their history and value as illustrating civilization. If philology be defined as the restoration to knowledge of past thought through the medium of the word, it is apparent that no study of literature, however simple and however approximately contemporary the literary monuments may be, can be carried on without the employment in some degree of philological methods. The so-called philological approach to the study of literature has been at times not without its unwise advocates. To parse through the whole of *Paradise Lost* and to examine the etymology of every word may be philological study of a kind, but it can scarcely be called literary. Philology must serve as a handmaiden to literature in the interpretation and elucidation of texts, but there is no immediate way of entry into the processes of literature through the study of individual words. Among other practical uses of philology regarded as linguistics may be mentioned that of seeing that the historical records of the speech and literature preserved in manuscripts and in texts, often few in number and difficult of access, are brought to light and secured against the accidents of time by publication. The reëditing of texts in the light of fuller modern scholarship is also a duty of the philologists not to be evaded. Sound philological principles are manifestly as important in the editing of a modern text as of one of medieval or ancient times. Philology may also be of service in the daily practical use of language, especially in determining questions of propriety and conduct in language. (See article on ENGLISH USAGE.) A still larger field of practical philology is to be found in the whole province of rhetoric. Rhetoric attempts to teach an art of language, and instruction in this art is greatly assisted by the ability of the teacher and student to analyze and to comprehend the principles of the art. Rhetoric consequently, if it means anything at all as a systematic discipline, means the application of the methods of observation and analysis to the processes of language expression upon which the science of philology rests. Other practical applications of philological science, *e.g.* the production of descriptive grammar for the use of the students of a language who are seeking to acquire a practical control over it, the analysis of speech sounds as an aid in the teaching of spoken language, etc., are too obvious to require mention.

The present academic status of the study of philology has been implicitly indicated in part in the description which has been given of the subject. A more detailed account of the courses will be found in the articles on MODERN LANGUAGES AND LITERATURE; also in those on GREEK LANGUAGES AND LITERATURE; LATIN LANGUAGES AND LITERATURE; SEMITIC LANGUAGES AND LITERATURE. G. P. K.

See GRAMMAR, for comparative philology; LANGUAGE, ENGLISH; LANGUAGE, PSYCHOLOGY OF; MODERN LANGUAGES AND LITERATURES.

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PHILOSOPHICAL SYMBOLISM. — See SYMBOLISM IN EDUCATION.

PHILOSOPHY. — Definition and Scope. — The term philosophy (in the form of the verb φιλοσοφεῖν) seems first to have been used by Herodotus and Thucydides in its literal sense, to denote the desire or pursuit of wisdom. The speculative bias of the Greeks made them restrict the term philosophy to theoretic knowledge only, *i.e.* knowledge pursued for its own sake as opposed to that which is technical or immediately practical. The terms science, true knowledge, and philosophy are used almost interchangeably by Plato and Aristotle. The idea that philosophy is not ordinary knowledge but has for its object something of superior worth, to wit, the real as opposed to the phenomenal, is due to the Platonic doctrine that true knowledge can be only of the immutable and the eternal (*Rep.*, 480). Aristotle also emphasizes the fact that philosophic or scientific knowledge is reasoned or demonstrative, and, therefore, depends on knowledge of causes or principles. Though Aristotle wrote on political and natural history he seems to have clearly distinguished between history and science or philosophy. Both Plato and Aristotle, while setting a high value on mathematics, hesitated to apply the term philosophy to it. Thus Plato put mathematics in the borderland between true science and opinion; and Aristotle, while explicit in his statements that metaphysics, physics, and mathematics are the three parts of theoretic philosophy, and in his reference to metaphysics as the first and to physics as the second philosophy, does not explicitly refer to mathematics as the third philosophy. Nevertheless, mathematics did not become generally dissociated from philosophy until the Alexandrine period (*e.g.* Euclid), and even later we find the book of Sextus Empiricus, *Adversus Math.*, directed against the philosophers or metaphysicians.

The distinction between philosophy and the special sciences seems to have been accentuated by the Stoic and the Epicurean philosophies, with their emphasis on ethics as the major portion of philosophy. In the light of the popular use of the term philosopher as synonymous with that of moral teacher or guide, and the prevailing idea of philosophy as a mode of life, pursuits like those of Archimedes could not be referred to as philosophical. At any rate, the Alexandrine period finds a number of special sciences cultivated separately from philosophy.

In medieval times, philosophy seems to have been used to denote all the knowledge which can be acquired by natural reason without the aid of revelation. In practice, this meant all the subjects treated by "the Philosopher," *i.e.* Aristotle; and as these formed the substance of all arts courses, the faculty of arts became known as the faculty of philosophy. The "three philosophies" denoted moral, natural, and metaphysical philosophy.

As a result of the development of natural philosophy into the independent science of physics, and the emphasis on the problems of thought or consciousness in writers like Locke, the term metaphysics gave way to the term mental science or intellectual philosophy. As a result, also, of the expansion of modern science and its imperative demand for specialization, the parts of moral philosophy known as jurisprudence, law of nature, politics, and economics, — subjects on which an eighteenth century professor of philosophy like Adam Smith was expected to lecture, — soon became objects of study on the part of specialists who did not concern themselves with the rest of philosophy. For the last forty years empirical psychology has been assuming more and more the rôle of a special science, as independent of philosophy as the science of optics. In our own day there is a strong tendency for investigators in the field of logic to regard their subject as a branch of either psychology or mathematics; and an increasing number now view the field of ethics as part of sociology or anthropology.

After the special sciences have thus been carved out of it, what, if anything, is left of philosophy itself? The typical answers to this question may be arranged in three groups, between which hard and fast lines cannot be drawn:—

(*A*) Those that deny that there is any peculiar subject matter or method in philosophy. This is the view of the agnostic and positivist schools. To both Spencer and Comte philosophy consists simply in the unification or coördination of the various sciences. In Spencer this unity is a mere juxtaposition,—the only bond uniting the various sciences being the fact that they all have certain vague general laws of evolution in common. In Comte the unity is one of end. In constituting the positive philosophy the various sciences are subordinated to each other in accordance with the needs of the positive polity. In harmony with the above is the popular view, supported in some respects by Paulsen, that philosophy is simply the sum of the general portions of the different sciences.

(*B*) Those that insist that philosophy still has a subject matter distinct from that of the special sciences, viz. the real or the rational. This group includes representatives of most diverse schools of philosophic thought, who, of course, conceive this subject matter in different ways. Thus, the Hegelian school conceives the subject matter of all philosophy to be the ultimately real, or absolute Idea, a knowledge of which we obtain by a system of reasoning. The mystic schools all conceive the real, which is the quest of philosophy, to be in the ineffable One attained in certain experiences, called feeling or intuition. Between these two schools may be placed an influential group of thinkers like Münsterberg, Duhem, and Bergson, having little in common save the view that the special sciences all deal, not with reality, but with systems of useful constructions of the mind, and that it is, therefore, left to philosophy to deal with reality itself, by intuition (Bergson), by dialectic reasoning (Münsterberg), or by faith and reason (Duhem).

(*C*) Mediating between (*A*) and (*B*) is the view that philosophy has a distinct subject matter of its own, but that this subject matter is no other than the system of the special sciences; that is, that philosophy is itself a special science, viz. the science of the sciences. This science may be conceived in quite naturalistic fashion. . . . "Sciences, then, are as real things as facts themselves. . . . We can analyze them as we analyze facts, investigate their elements, composition, order, and subject" (Taine). The view, however, which has, owing to the influence of Herbart, Wundt, and the Neo-Kantians, prevailed for the last generation has been a more critical one. It is supposed to be the business of philosophy to analyze and criticize the fundamental concepts and assumptions of the special sciences, and to build up a *consistent* world view on the basis of this critical work.

The greater intimacy, however, between philosophy and the special sciences during the past decade has brought to light the following considerations: (1) that the criticism of the assumptions of the various sciences can be made only by those who are already in possession of a certain definite *Weltanschauung*, (2) that there are no contradictions infesting the special sciences to such an extent that the scientists are helpless and need the aid of philosophers, and (3) that the fundamental concepts of the different sciences can be analyzed only in the light of the special content of these sciences, and that the specialist is, if he undertakes it, the best qualified to make this analysis.

The feeling has also arisen recently that the function of philosophy is obscured by a too close assimilation of it to science, and that its nature is in many respects akin to art and poetry (see *Journal of Philosophy*, vol. 7, p. 406).

In spite, however, of all these diverse views as to the nature of philosophy, all are substantially agreed that its aim is to give us a coherent view, or outline chart, of the universe and the place in it of man, the external world, and the higher Reality, if there be any. There is also a practical agreement that a department of philosophy in a college or university should teach metaphysics (including philosophy of mind, and philosophy of religion), logic, ethics, æsthetics, and the history of philosophy. Professor Fullerton has made the interesting attempt to show that these apparently diverse disciplines (including psychology) have not been grouped together by mere accident, but that they all have something fundamental in common, viz. that they all raise problems of reflective thought, *i.e.* problems involving the critical examination of the meaning of our ideas. (*Intro. to Phil.*, pp. 223–260.)

Metaphysics, logic, ethics, and the history of philosophy, then, represent the irreducible minimum of a department of philosophy. Though many philosophers emphasize the primacy of psychology as a philosophical discipline, psychologists as a rule are anxious to have their science free from all philosophic entanglements. In many of our universities psychology now forms an independent department, and at the St. Louis Congress of Arts and Sciences (1904) the psychologists were grouped not with the philosophers but with the other students of natural science. In France lectures on sociology are still given by professors of philosophy and this is also true of other Latin countries, especially Spanish America where French positivism has been very influential. No one, however, doubts that the specialization of the social sciences is inevitable. In the United States courses in education are often given by the department of philosophy, but though philosophy must always play a prominent part in educational theory, it is only for administrative reasons that the two departments are united. In many American colleges courses in the history of mathematics, chemistry, etc., are given by the departments concerned; but in the very few instances where courses in the general history of science are given, this is done by the department of philosophy. In European institutions even the history of special sciences is given by the department of philosophy; and when a physicist like Mach begins to lecture of the history of his own science, it is thought proper to transfer him to the department of philosophy. The history of science is, however, a very much neglected field in any case. For the individual philosophic disciplines, see ÆSTHETICS, ETHICS, LOGIC, and METAPHYSICS. For schools of philosophic thought, see MATERIALISM, SPIRITUALISM, IDEALISM, REALISM, PHENOMENALISM, RATIONALISM, MYSTICISM, EMPIRICISM, SCEPTICISM, CRITICISM, POSITIVISM, INTELLECTUALISM, VOLUNTARISM, PRAGMATISM, MONISM, AND PLURATISM.

History of the Teaching of Philosophy. — *Among the Ancients.* — India and China seem to be the only Oriental countries that independently developed definite schools of philosophy, *i.e.* bodies of doctrine more or less systematically and continuously taught from generation to generation. Thus we have in China the speculative school of Lao-tze, Licius (Lieh-tzi) and Tschaung-tze, and the moralistic school of Confucius and Mencius beginning in the sixth century B.C. and continued into the Christian era. In India we have six great historical schools of which the Sankhya, Vedanta, and Yoga are best known in the West.

The earliest form of teaching took place under the form of voluntary discipleship; the disciple attended the master and learned from him in the course of ordinary conversation or whenever the spirit moved the master. Such a life frequently involved celibacy. The typical Hindu teachers of philosophy live apart on a mountain or in a grove in simple abstemious fashion, spending the time "in listening to serious discourse and imparting their knowledge to such as will listen to them" (Max Müller, *Six Systems of Indian Philosophy*, p. 35). We also hear of philosophic and religious congresses and of philosophic disputations at kings' courts, and, in Buddhist times, of monasteries, famous schools, public lectures, etc.

Before the extensive use of textbooks was possible, instruction was given in the form of short mnemonic aphorisms, easy to hand on unaltered from generation to generation, but so brief and packed with meaning as to need extensive commentary to make them intelligible. Such teaching, therefore, tended to become dogmatic and esoteric.

The Græco-Roman Period. — The earliest form of philosophic teaching among the Greeks was probably also in the form of aphorisms of Wise Men; and Thales, the founder of the Milesian school of philosophy, was regarded as one of the Seven Wise Men of Greece. Popular philosophic instruction was also given by the wandering bards, of whom Xenophanes, the founder of the Eleatic School, was a remarkable example. The Pythagorean School was definitely organized, and demanded certain modes of life of its members to enable them to pursue its characteristic studies.

The expansion of Greek life and culture in the fifth century B.C. brought into existence the professional teacher or sophist. The wandering sophist was an itinerant university, gathering all sorts of pupils and teaching them all subjects. The various schools which owe their impulse to Socrates were largely influenced in their foundation by their feeling of protest against the introduction of professionalism into the life of culture. Socrates taught by means of his peculiar method of questioning — noteworthy in the history of education as an indication of the complete absence of the authoritative note, and thus characteristic of the spirit of free inquiry among the Greeks. Plato tried hard to avoid the lecture system of the sophists, but Aristotle returned to it. Socrates refused to accept any fees, and Plato was too independent, but Speusippus, Plato's successor in the Academy, found it necessary to accept fees. At the end of the fourth century B.C. we find separate and distinct from the schools of rhetoric four well-established permanent schools of philosophy (the Academic, the Peripatetic, the Stoic, and the Epicurean) which made Athens the world's center for philosophic instruction. These schools continued their existence till closed by Justinian (in 529). The corporate character of these schools (for which see ATHENS, UNIVERSITY OF; GREECE, EDUCATION IN; UNIVERSITIES, etc.) made them emphasize adherence to traditional doctrine of the school rather than independence of thought.

With the introduction of Greek culture into Roman society, philosophy became a standard form of education coördinate with jurisprudence, rhetoric, and medicine. It became customary for the great families to send their sons to Athens to study philosophy. Philosophic education at Rome, however, was mainly carried on through private tutors who regarded their office as that of a physician to the morals of those whom they instructed.

Disinterested play of the intellect gave way, under this régime, to the inculcation of sound moral maxims or precepts (Seneca, *Ep.*, 49, §5). We have, however, pictures of lecture theaters crowded to hear philosophic orations or debates between rhetorical philosophers. We also hear of philosophic missionaries, like Apolonius of Tyana, exhorting and appealing to the crowds in the market place.

Alexandrian Schools and Arabic Influence. — In the third century B.C. the great libraries and museums and the liberal policy of the Ptolemies towards scholars made Alexandria (see ALEXANDRIA, SCHOOL OF) an endowed research university, a great center of learning rather than of instruction. It became also the chief meeting place of Greek philosophy and Oriental religion. From it issued Philo's doctrine of the Logos (see PHILO OF JUDÆA), and the chief intellectual moulds for the dogmas of the Christian Church. In the revival of religious and speculative philosophy in the third century (A.D.) Alexandria was also the birthplace of Neo-Platonism (*q.v.*), which, by claiming to unite and restore the philosophy of Plato and Aristotle, became the rallying ground for those who wanted to maintain the old Hellenistic culture against the rising tide of Christianity. It was also principally at Alexandria that Christianity, under the leadership of men like Clement and Origen (*qq.v.*), began to yoke Greek philosophy into its service. The catechetical schools (*q.v.*) of Egypt and Syria were the first to introduce the study of philosophy into Christian schools. From the Syrian schools of Edessa and Nisibis the study of philosophy was carried into Arabic or Saracen culture. The Arabic translations of Aristotle were carried across North Africa into the Moorish centers of learning in Spain, and there they were, together with Arabic commentaries, translated into Latin and brought back to Europe, principally through Hebrew translators.

The Middle Ages. — In the fifth century, with the barbarian invasions and the decay of Roman culture, philosophic study became practically extinct in Western Europe. Some logic, however, continued to be taught as a part of the cycle of liberal studies; and when the Christian monastic schools took over the elements of the later Græco-Roman system of education, logic remained the only school discipline having any connection with philosophy. (See article on LOGIC.)

Though Porphyry's *Introduction* stated the problem of universals out of which medieval philosophy grew, the regular school teaching of logic was mainly formal. While there were noted examples of philosophic speculation, as John Scot in the ninth and Gerbert in the tenth century, it was not until the end of the eleventh century that philosophic teaching may be said to have been resumed in what had been the Western Empire.

The revival of philosophic study received its impetus first from the theologic interest in the question of universals, secondly from the recovery of the more important Aristotelian logical writings (the *Analytics*, etc.) either in Boethius' translation or that of Jacob Clericus (1128), and thirdly from the introduction of Aristotle's *Metaphysics*, *Physics*, and *Ethics*, through the Arabic translations and commentaries, at the end of the twelfth century. After 1254 logic and philosophy formed nearly the whole of the curriculum, the old quadrivium being relatively neglected. No uniform or sharp line was at first drawn between the universities and the older monastic schools. The latter continued to teach logic and sometimes one or other of the "three philosophies." As late as 1540 we find Ferrerius publicly lecturing in the chapter house of the Abbey at Kinloss on Aristotle's *Ethics*, *Politics*, *Physics*, *Metaphysics*, *Economics*, and *Psychology*. The growth of the universities, however, led the grammar, burgh, and landschulen to restrict themselves to grammar and logic and sometimes to the former only. (See UNIVERSITIES and MIDDLE AGES, EDUCATION IN.)

The logic of the syllogism, however, extended its sway over the whole range of higher education. Every study was reduced to a number of "questions" and thus made suitable for syllogistic reasoning. The presence of a large body of authoritative doctrines in the form of unquestioned self-evident principles, sentences from the Bible, the Christian Fathers, the "Philosopher," and the Doctors of the Church, made this procedure possible. Syllogistic disputation also adapted itself to the strong controversial spirit of the medieval age. The disputes between the nominalists and the realists were carried on with such violence that the king of France had to forbid all disputations on such "inflammatory subjects." In an age devoid of our modern means of publication and dissemination of the news of the intellectual life, the wandering scholar provided a means for intellectual entertainment and popular instruction.

The Renaissance and Later. — The movement known as the Renaissance brought back to Europe Greek philosophy other than Aristotle; and even Aristotle began to receive a new interpretation in the light of the Greek text and the commentaries of Alexander Aphrodisius instead of the commentaries of Averroës. The spirit of free inquiry led to a questioning of the classic medieval view of the universe based on Aristotle, and brought Plato and Plotinus (*q.v.*) to the fore. University teaching of philosophy, however, was not profoundly affected by this movement, which was organized in societies or academies like the Florentine and supported by liberal princes. The humanists approached philosophy from the literary rather than from the logical or "scientific" side. The universities substituted the Greek text of Aristotle for the Latin one, and some of Plato's dialogues were admitted into the orthodox curriculum, but the old methods remained. Logical disputations and the public defense of these continued to be required for graduation, even in the medical faculty, down to the nineteenth century.

Outside of the universities, also, began the mathematical-physical philosophy of Copernicus, Keppler, Descartes, Galileo, and Leibnitz. This new philosophy found its support in the great scientific academies (*q.v.*) founded in the seventeenth century. To a certain extent this new philosophy also found support from the new liberal culture which began in France under Louis XIV and which was supported by all the liberal courts of Europe. Leibniz, who disdained to seek a university position, is the typical representative of this new culture and philosophy. Cambridge seems to have been the first university to hear the appeal of men like Barrow to stop speculating about "*entia rationis, materia prima,* and such like scholastic chimeras" and turn (1659) to the mathematical philosophy of Galileo and Descartes. But even here the influence of its own Newton was comparatively slight throughout the eighteenth century. In Germany the scholastic philosophy was replaced, after a struggle in which the authority of the liberal Frederick the Great proved the decisive factor, by the Leibnitzo-Wolffian philosophy of "reasonable thoughts." Through the influence of men like Martin Knutzen and his more famous pupil, Kant, the Newtonian view of the physical universe entered into the universities. In France the removal of Church control over the faculty of philosophy in the eighteenth century made possible the introduction of Descartes. The modern scientific, as opposed to the scholastic spirit did not, however, completely triumph in academic philosophy until the second half of the nineteenth century.

Of great importance to the teaching of philosophy was the change of the language of instruction from Latin to the vernacular. This change was begun, in spite of bitter opposition, by Thomasius at Halle, in 1694, and was not completed until the first quarter of the nineteenth century. The poverty of material in the old scholastic philosophy was hidden by the learned language in which it was delivered. When men began to lecture in the vernacular they had to attend more to the substance of their teaching.

Philosophy in the American College. — *History.* — From the beginning, philosophy was taught by the class tutor on the basis of the scholastic manuals then used in England. Before 1664, when the three-year curriculum prevailed at Harvard, provision was made for logic and physics in the first year, ethics and politics in the second, and philosophic disputations in the third. At the end of the seventeenth century we find logic taught in the first two years from the Latin manuals of Peter Ramus and Burgerdicius, in the third year Henry More's *Ethics* and Dr. Morton's *Physics and Metaphysics,* and in the fourth year Divinity. At the beginning of the eighteenth century Locke's *Essay on the Human Understanding* was introduced into the curriculum, and remained throughout the eighteenth century the starting point of American philosophy, as can be seen in such different types as Franklin and Jonathan Edwards. Berkeley and Hume had relatively little influence, the former being a Bishop of the Church of England and the latter suspected of being both a sceptic and a tory. The deistic controversy and the question of free will in relation to Calvinistic theology limited almost entirely the range of philosophic interest. At the end of the eighteenth century new influences began to come in, French materialism as represented by Priestley, and Scotch realism as brought over by President Witherspoon. The former was influential mainly in the South, but the latter swept the country, and in the middle of the nineteenth century was the predominant influence in the philosophy taught in American colleges. Reid, Stewart, and Brown were several times reprinted in America, and in the second third of the nineteenth century Hamilton's lectures went through several American editions and abridgments. Paley's *Moral and Political Philosophy* and his *Evidences of Christianity* also came in at the beginning of the nineteenth century. In the fourth decade of the nineteenth century Cousin and French Eclecticism became influential. Partly through the influence of German immigrants and the St. Louis School of Philosophy, headed by Dr. William T. Harris, and partly through the influence of teachers trained in Germany, Kant and Hegel began to dominate academic philosophy in the last quarter of the nineteenth century. Though Mill and Spencer were widely read, they had little influence on the academic teaching of philosophy.

By the beginning of the nineteenth century separate chairs in mathematical and physical science were established in most American colleges, but so late as 1838 the course in philosophy at Amherst included mechanics, electricity, etc. In the first half of the nineteenth century economics was separated from philosophy in some of the larger colleges, but this separation was not completed in other colleges before the twentieth century. The modern period of the American college with its large field of electives may be said to have begun in the last quarter of the nineteenth century. Previous to that, philosophy was all prescribed and generally crowded into the last year or two, as one of the higher branches calculated not only to train the student in scholarship but to fit him for practical life.

Aim. — It is agreed by all that the training of specialists in philosophy is beyond the scope of the American college. Is philosophic training, then, an indispensable element of a liberal education for citizenship in the larger life? In urging an affirmative answer the following points have been made: —

(1) Philosophic knowledge is a desirable end in itself. "Just to face these profound problems concerning the being, the origin of, and the destiny of man . . . just to know that there are such problems, and something of how the soul of man has in thought and feeling responded to them, is of itself no small part of liberal culture." (Ladd, *Educational Review*, X, p. 232.) Even if we regard philosophy as setting or solving no problem, the inspiration which comes from the knowledge of man's search for the thoughts that give value and dignity to human life is one of the best things that a liberal education can offer.

(2) Others emphasize not so much the knowledge itself as the philosophic habit. The philosophic or reflective habit is absolutely essential in order to enable the student to bring together the diverse fragments of knowledge picked up in the different departments, and to organize the contents of his mind into some unity. The need for such unity is especially evident when one reflects on the chasm which generally separates the religious ideas which the student brings to college from the scientific ideas which he gathers in such courses as geology, biology, or psychophysics. The philosophic habit prevents a man from becoming a narrow partisan, and in this way it is one of the finest flowers of culture.

This last aspect of the situation leads some to emphasize the ethical aim in philosophic teaching. More important than a knowledge of philosophic problems past or present is it that the student should be started in the business of philosophizing for himself. Students as a rule come to college slaves of traditional forms of thought and conduct, and to train them to become freemen of the intellectual life is the function of the devoted teacher of philosophy. Just because its results are not so certain as those of mathematics or the natural sciences, the student cannot find the answer before thinking the matter out for himself. Most people doubtless get this training in actual life in the school of experience; but philosophic training accomplishes it at less expense.

Methods. — No other teachers have, as a body, given so little attention to the pedagogy of their subject as the American teachers of philosophy; with the result that at least one professor of philosophy confesses, "It is possible that there has been more poor pedagogics in this field throughout the ages than in any other branch of the university" (*Journal of Phil.*, VII, p. 569). The pedagogic principle which has revolutionized modern science teaching, viz. to begin with the concrete nearest the pupil's own experience rather than with the abstract elements of the subject, has not yet found full recognition in philosophic teaching, though some philosophic teachers have exemplified it beautifully. The philosopher is peculiarly apt to think that he is going from the simple to the complex when he is really proceeding from the abstract to the concrete (*q.v.*), forgetting that the abstract elements familiar to himself are strange and difficult of apprehension to the beginner.

The peculiar difficulty about philosophic teaching is that it involves on the part of the pupil an apparently different mode of thinking from the one to which he has been accustomed, a peculiar turning back on one's usual ideas; and this undoubtedly appears to the beginner both forbidding and fruitless. The problem, then, is how to make philosophic problems real to the student. How is the student to be seriously interested in philosophic issues and to be trained in the difficult art of philosophic thinking? We must show the vital importance of the subject from the beginning. For unless we succeed in showing the student that philosophy is a matter of life and death, essential to his own intellectual salvation, we cannot generally draw out the best efforts.

The pedagogic means generally used in the teaching of philosophy are the lecture, the quiz, the assigned reading, the essay, the recitation, discussion, and the pamphlet or question syllabus. As a method of philosophic teaching the lecture has, besides the disadvantages incident to it in other subjects, the added one that it must, in order to enable the student to follow it intelligently, necessarily avoid intricate questions or very close reasoning. The philosophic lecturer may have to present examples of reasoning as closely knit as that of the mathematician, but he has not the advantage of making it all visible on the blackboard. To offset this partly, some teachers put an outline syllabus in the hands of the pupils before the lecture. Even so, the lecture seems well adapted only to introduce or open up a topic and to summarize a discussion.

In many of our large colleges the professor gives two lectures a week, and an assistant meets the class, usually in smaller sections, for quizzes on required reading or on the substance of the lectures. The attitude of the students who, judging by the position of the assistant, regard the quiz as of secondary importance, makes this arrangement a more or less perfunctory affair, seldom productive of genuine enthusiasm. It is generally felt that the quiz should give way to the full recitation where the student and instructor can discuss the subject matter at length and not be compelled to take up any new topic before coming to a satisfactory termination of the one in hand.

The objections to discussion, especially when instructors allow students to discuss with each other in class, are: (1) It is apt to give students the impression that philosophy is all a matter of opinion. (2) The variety of views that come into discussion is apt to be confusing to the beginner. (3) The discussion is apt to run into very minor matters and make students lose sight of the big issues. Discussion frequently degenerates into repetition of opinions, with no advantage except, at best, developing the student's cleverness at finding arguments. (4) Discussion or Socratic questionings must be profitless if students have not some previous knowledge of the subject to be discussed, and have "no method of ordering their thoughts in truth-giving directions."

In answer to these it may be maintained (1) that philosophy must begin with opinions, but opinions have to be made systematic and consistent with the whole of experience. The age of dogmatic manuals of absolutely certain truths is past, and those who sigh for them, as after the fleshpots of Egypt, do so in vain. (2) A critical attitude to one's opinion is the most effective method of philosophizing. (3) The teacher can correct the shortcomings by actively and critically guiding the discussion without dogmatically asserting his own opinion more than is necessary for effective summaries or searching questions. (4) Discussion has been called by Professor James the philosopher's laboratory, and the mere clash of one's opinion with that of others is an illuminating experience preventing one from returning to previous narrow dogmatism. It must also be maintained that philosophy does not have to start with a clean slate and that it may and must, to be effective, grow out of what the student already knows, and thinks.

A device which Professor Garman introduced, and which he considered as much of an invention as printing by movable type, is the pamphlet. In these pamphlets some problem is stated or developed, but without any definite solution. These are loaned to the student, who, thus shut off from the possibility of turning to the next page to find the solution, is compelled before entering the discussion in the classroom to think the matter over and formulate his own answer. The instructor is then in a position to know whether the students are taking serious hold of the subject.

The intensive reading of classical texts forms part of most courses in philosophy. The frequent writing of essays is now recognized as a powerful instrument to bring the student's ideas together and make them clear to himself. For this reason some teachers encourage their students to write on subjects on which the latter have little information, or on topics which have not yet been discussed in the classroom. The essay is thus a means to compel the student to think on the subject. The reading of texts, however, needs elucidation, and both text and essay need to be supplemented by thorough discussion and criticism to make them effective.

Philosophic clubs in many of our colleges frequently increase interest in philosophic studies. In many of our colleges connected with graduate schools senior students also have the privilege of entering the seminar courses.

Organization of a Department of Philosophy. — Philosophy is usually regarded as a difficult subject requiring some maturity and knowledge of other studies. Hence, it is considered advisable to begin the study of philosophy in the upper classes. This arrangement, however, limits the number of courses that the undergraduate can take, and teachers who are anxious that students should have the advantage of the more advanced courses are in favor of opening the philosophy department to sophomores or even to freshmen.

As so much depends on the starting point in philosophy, the question, "Which course should be given first," is of great importance. There is, however, nothing like agreement in the answer. The historical answer, of course, is logic, which has for over 2000 years served as a propædeutic to philosophy. Even the driest treatise on formal logic raises a number of distinctly philosophical issues. Thus the relation of the universal to the individual, of terms to objects, judgment to reality, etc., all lead to philosophic issues of deepest moment. But the dry and apparently fruitless character of syllogistic exercise seems to postpone rather than introduce the vital issues of philosophy.

A great many colleges now offer psychology as the first course. The plausible argument is made that acquaintance with the workings of the human mind is a prerequisite for philosophy. But the growing disfavor of analytic or non-laboratory psychology raises difficulties in the way of this mode of introduction to philosophy, and raises the doubt whether physiology or physics is not just as much a prerequisite for philosophy as psychology. At any rate, neither logic nor psychology contain enough philosophy.

The main issue seems to be, however, between those who believe in beginning with the history of philosophy and those who believe in beginning with some survey of philosophic problems. The great arguments for the historical introduction are: (1) that an approach through a survey of problems is apt to be partial and one-sided, and (2) that the history of philosophy gives one the proper perspective to appreciate the problems. In answer, however, it may be urged (1) that there is nothing pedagogically wrong in starting with a partial and one-sided view, provided we supply the motive power to enable the student to go on to a wider view. As a matter of fact the great historical system grew out of certain problems. (2) The student cannot get the proper perspective of the history of philosophy without some preliminary appreciation of the problems themselves. The student is too immature to grasp the problems confronting Plato, Aristotle, or Descartes without having done any philosophic thinking on his own account. The effort on the part of teachers to simplify the teachings of the great masters and to make them intelligible to beginners leads to a certain conventionalization of their teaching, amounting to caricature. (See Owen Wister's *Philosophy Four.*)

Among those who urge that we should begin with the study of problems, no general agreement as to the content of these problems exists. Where such courses are given, they generally consist in an excessive simplification of the main problems of metaphysics and epistemology, *i.e.* an elementary treatment of the issues between monism and pluralism, idealism and realism, etc. As an introduction to the technical problems and to show how these problems grow out of real life, the fields of Religion, Science, Literature, History of Civilization, or Ethical and Political Problems have been suggested as supplying the proper material.

Metaphysics or General Philosophy. — The course in metaphysics in the seventeenth and eighteenth centuries was predominantly one in natural theology, with special reference, in the eighteenth century, to the deistic controversy. The introduction of Locke in the beginning, and of the Scottish philosophy at the end of the eighteenth century, brought psychologic elements into the course and soon led to separate courses in theism and mental or intellectual philosophy. The introduction of German philosophy in the latter part of the nineteenth century brought epistemologic considerations forward, and for a time it seemed as if epistemology would replace metaphysics. This tendency, however, to regard epistemology as independent of metaphysics is now on the wane, but separate courses in epistemology, the theory of knowledge, or philosophy of mind are still given frequently, for epistemologic questions are decidedly in the foreground of current philosophic discussion. In determining the scope and the setting of the problems in the modern course of metaphysics, Lotze's *Metaphysics* has been very influential. Recently Taylor's *Elements of Metaphysics* has become popular with American teachers.

Within the past decade there has been a revival of interest in classical metaphysics, *i.e.* in problems of ontology and cosmology, and courses on the philosophy of nature are increasing. It is urged on behalf of the latter course that its subject matter is concrete and that the student has a feeling of dealing with the actual world. The course in the philosophy of evolution given in several colleges belongs to the same category.

A course which has now almost disappeared from the curriculum of the American college is the one in the philosophy of history. Under the influence of books like Bunsen's *God in History* and Hegel's *Philosophy of History* this course was frequently given. With the reaction against *a priori* methods in history this course fell into bad repute. Recently, however, several have urged its reintroduction in a form consonant with the spirit of present-day philosophy. Professor Hudson has advocated making it the introductory course in philosophy. (*Journal of Phil.*, Vol. VII, p. 426.)

History of Philosophy. — The course in the history of philosophy is like the study of history itself, a comparatively modern addition to the curriculum of the American college. The history of philosophy acquired the dignity of an academic discipline when Hegel made it appear as a rational system. At any rate, Schwegler's *History of Philosophy* (in Seeley's or Stirling's translation) seems to have been the first widely used textbook in this field in American colleges. One or two terms are usually devoted to this course. When the latter is the case, ancient philosophy is taken up in the first and modern philosophy in the second term. Little attention is given to medieval philosophy, and modern philosophy is usually ended with Hegel or Lotze, if not with Kant. In one or two of the colleges connected with graduate schools students have the opportunity of taking the special course in contemporary philosophy.

Courses in special periods of modern philosophy such as Continental Rationalism (Descartes, Spinoza, and Leibnitz) or British Empiricism (Locke, Berkeley, and Hume), are given in most colleges having a developed department of philosophy. Sometimes we have also special courses in Plato, Aristotle, or Kant. But almost no courses are given in the history of special fields such as logic, epistemology, or ethics.

With the waning of the metaphysical interest in the latter part of the nineteenth century, the history of philosophy threatened to absorb all the vitality of the philosophy department, and in the United States as in Germany the number of courses in the history of philosophy was almost equal to the combined number of all the other philosophic courses; but this historical wave is now receding.

In the teaching of the history of philosophy some emphasize the history and others the philosophy. The former method has been the hitherto prevailing one, — so much so that a recent college textbook in this field includes and emphasizes a great deal of geographic information. The generally recognized danger in the teaching of the history of philosophy is the breeding of a shallow skepticism through the kaleidoscopic picture of the rise and fall of different systems. To offset this, many teachers try to emphasize the historical continuity of philosophic problems. The attempt, however, to minimize philosophic differences or the controversial element tends to exaggerate the conventionalization of the doctrines of the great philosophers. To guard against this, some reading in the sources, Plato, Descartes, Locke, etc., is frequently prescribed, even in the general course on the history of philosophy. To make this reading effective, however, intensive study is needed, and one has to give up the continuity of the historical survey.

Those who would emphasize the philosophy rather than the history in this course are quite willing to leave a great many lacunæ in the history and to select only those problems " which bear a significant relation to the issues and interests of our own time. In expounding a philosopher we should not try unsuccessfully to take the view point of his contemporaries, but should treat his problems and theories frankly from the standpoint of the present."

For the course in Æsthetics or Philosophy of Art, see article ÆSTHETICS.

Relation of Philosophy to the Other Departments. — The growing specialization in the different fields of human knowledge and in departmental teaching has brought about a strong habit on the part of teachers of philosophy to avoid all issues of fact which are the subject matter of the various sciences. This has tended to eviscerate philosophic teaching and to give it the appearance of a fruitless occupation with empty forms devoid of content. Fortunately, however, the sciences, especially physics and biology, are now outgrowing their juvenile fear of metaphysics, and the philosophic spirit is growing in the various sciences, as well as in the philologic and literary courses. Teachers of philosophy now advise their students to take various courses in other departments in order to make their philosophic study more thorough.

Philosophy in the Universities. — *The American Graduate School.* — The aim of graduate instruction in philosophy is to give the student the technical equipment needed to teach and to advance philosophic knowledge. It terminates with the conferring of the Doctorate of Philosophy. As the requisite philosophic ability is not widely distributed, our best graduate schools make it distinctly understood that this degree will be granted only to those who have distinctive ability in this field.

Graduate students in philosophy are (1) those who intend to teach philosophy, (2) students of divinity, or (3) students of other subjects, such as education, who regard advanced philosophic studies as helpful in the preparation for their special careers. Of these three classes only the first and part of the second try to complete the work necessary for the doctorate in philosophy; the others are usually satisfied with the M.A. in this branch of study, or, where the group system prevails, they choose it as one of their minors for the Ph.D.

Instruction is given mainly through lectures and seminar or research courses. The lecture in the graduate schools can be more frankly the statement of the lecturer's own philosophic views or interpretation of classical doctrines than is possible in the college. The distinctive work of the graduate school, however, consists in the training for research, and this is done principally in seminar courses. The essence of the seminar course is that the student should have the opportunity to report from time to time the result of some research, or his own constructive thinking, and have it subjected to the thorough criticism of his fellow students and of his instructor. Many courses not announced as seminars are practically conducted in this way (practica). The typical seminar is announced as restricted to some one general field, *e.g.* advanced logic, and the different members report on different topics in this field which they have chosen for the year. Some professors assign only one topic, *e.g.* the relation of mind and body, as the subject for the year, and various students report either on different aspects of this question or on the different classical views which have been maintained with regard to it. In this latter form of seminar all students report at every session, instead of devoting an entire session to one or two reports.

Research Courses. — The minimum requirements for the Ph.D. are generally two years' attendance and the thesis. As the topic of the thesis seldom falls within the subject of a regular seminar course, the student misses any direct help in the preparation of his thesis. For this reason, some graduate schools have instituted research courses in which the student individually reports to the professor in charge of his field of inquiry.

In some of our graduate schools, instructors and advanced students meet from time to time to discuss philosophic problems of current interest. More often a journal club is formed in which the different members report on recent publications in the field of philosophy. Many of our universities make provision for the publication of philosophical studies. They are generally devoted to the publication of theses or syllabuses by the professors.

Philosophy in the German Universities. — The students now entering the university from the gymnasia have had practically no training in philosophy, and the great majority of the courses are, therefore, elementary and, for the most part, historical in character. Nearly all of them are lecture courses, whether public or private, requiring no work on the part of the student except such reading as he chooses to do on his own account. The students taking philosophy belong to different groups besides those who are candidates for the Ph.D. in philosophy. Philosophy is one of the subjects of the state examination which every candidate must pass in order to teach in the classical gymnasia. A good many of the universities still require philosophy as an additional subject (*Nebenfach*) from all candidates for the Ph.D. in the faculty of philosophy (*i.e.* Faculty of Arts and Sciences). Besides these, a great many people in Germany regard some university work in philosophy as essential to a liberal education, and even students of medicine, law, or technology attend many of the " public " lectures. The student has his first chance to report on his own work in the seminar which each ordinary professor gives in his field.

Courses in philosophy are either historical or systematic. Logic, epistemology, psychology, philosophy of history, ethics, pedagogy, and æsthetics form the topics of the systematic courses; but even these are largely historical. Philosophy of religion is left to the theologic faculty and philosophy of law to the faculty of law. In the reaction against the post-Kantian systems which ruled in Germany in the first half of the nineteenth century, the predominant interests developed were the epistemologic and the historical, and they are still foremost.

The requirements for the doctorate are the oral examination and the thesis, which is also most frequently historical. The fact that a doctorate is given with various grades, *cum laude*, *magna* and *summa cum laude*, makes it rather easy to get the degree with a merely passing mark. The result is that Germany grants more degrees in philosophy than any other country. The doctorate dissertation itself has been the subject of a great deal of criticism on the part of thoughtful German teachers, because, owing to the historical tendency, most students spend all their time in mere reading and senseless amassing of quotations. (See Paulsen's *German Universities.*) A great deal of criticism has also been directed against the extensive use of the lecture system. The appropriateness of the lecture in an age of quick printing has been questioned, especially by non-academic philosophers (E. von Hartmann).

Philosophy at Oxford and Cambridge. — Philosophic instruction at Oxford and Cambridge is nearly all undergraduate. At Oxford philosophy is required only of those who take the examination for final honors in *Literæ Humaniores* (" Greats ") and at Cambridge of those who prepare for the Moral Science Tripos. Only a little logic is required of passmen.

At Oxford philosophy is viewed simply as part of a classical education in the liberal arts. The content of philosophic study continues the humanistic tradition, and centers itself in Plato's *Republic* and Aristotle's *Ethics*, and the logical, metaphysical, ethical, and political questions they raise. No interest is taken in the history of philosophy; and medieval philosophy is entirely unknown in the University of Duns Scotus, Roger Bacon, and William of Occam. Of modern English philosophy only Bacon's *Novum Organum* is required. Though Hegelian philosophy has been very influential at Oxford in the persons of T. H. Green, Wallace, and Caird, Hegel has not figured in the official instruction given by the university.

In Cambridge the study of mathematics and physics has absorbed the vitality of philosophy. The Cambridge Platonists, a group of Neo-Platonic philosophers of the latter part of the seventeenth century, seem to have exerted no lasting influence on the University. Locke and Clarke were studied during the eighteenth century, but no importance was attached to such studies. Due largely to Paley, moral philosophy and natural religion were added to the regular examinations in 1779, and Paley's *Moral and Political Philosophy* became a standard textbook. In 1850 the Moral Science Tripos was instituted, largely through the efforts of Whewell, but it did not confer a degree till 1860. The Moral Science Tripos is somewhat more systematic than the philosophic portion of the examination in *Literæ Humaniores*, but success in it does not carry the éclat that goes to the student in the Classical or Mathematical Tripos.

Lectures at the various colleges are given by professors, lecturers, or readers, on the topics covered by the examination papers, but there is no discussion at these lectures, nor is there any task imposed on the student. Indeed, these lecture courses are simply supplemental to the real work of instruction given by the tutor. Students report weekly to their tutor, discuss their difficulties with him, and submit their essays to his criticism. The mode of life at both these universities is also conducive to a great deal of vigorous discussion among the students.

The advantage of the comprehensive final examination in philosophy is that the student cannot pass off his courses one after another (which can be done on the basis of piecemeal knowledge), but, instead, has to keep all his studies together throughout the entire period of study (about two years and a half). This undoubtedly is conducive to a genuine philosophic attitude in which the different portions of the field are compared, coördinated, and synthesized. At the same time Oxford and Cambridge teachers generally recognize that study with constant reference to certain questions to be asked on an examination is bound to be narrow and " calculated to forfeit the native instinct of curiosity of which, as Aristotle says, philosophy was born " (Mark Pattison). " It would be difficult for Aristotle himself to obtain a serious audience of undergraduates unless his teaching was understood to 'pay' in some Tripos " (Professor Sidgwick). The effort to win honors in a final examination is more likely to develop skill in answering certain questions than genuine philosophic insight.

Graduate study in philosophy may now be pursued at Oxford by those who enroll as candidates for the B.Sc. degree. But the number of such students is very small, and no special courses are given for their benefit. They simply pick out, subject to the approval of the governing committee, a series of courses from those given to undergraduates, and submit a final thesis.

Philosophic instruction in Dublin University is modeled on the Oxford and Cambridge plan.

The Scotch Universities. — Philosophic instruction in the colleges of the Scotch universities is given in regular classes, somewhat as in the American college. The tendency in the Scotch college, however, is to concentrate the philosophic teaching in one year and not subdivide it into fragmentary courses, except that additional courses are given for honor students. The regent or tutorial system was abolished at the beginning of the eighteenth century (though some of the professors continued to be called regents until the middle of the nineteenth century).

Owing to excessive religious division which, for historical reasons, arose between Catholics and Protestants, Episcopalians and Presbyterians, Established and Free Churches, the Scotch people have developed a keenness for controversy and an ability to trace subtle intellectual distinctions. Philosophy has, therefore, always been a favorite study with them, and they have developed their own national philosophy, which, however, has been profoundly influenced by German idealism. More than any other English-speaking people, they have developed the study of the philosophy of law.

Most of the Canadian, Australian, and even the newer English universities resemble the Scottish universities more than they do Oxford or Cambridge in their organization of philosophic instruction.

The French Universities. — Elementary instruction in philosophy is given in the last year of the lycée or collège — corresponding to the American high school. The graduate receives his baccalaureate degree and is then allowed to choose his professional course. Some students, however, attend courses in the faculty of letters or science before entering on their professional studies. In addition to the doctorate in philosophy, the various state examinations for the licentiate, and especially for the "aggrégation," also require a good deal of philosophical knowledge. In the Ecole Normale two years of philosophy are required of all intending to qualify as teachers of history and letters, and additional special instruction is given to those who want to teach philosophy in the secondary school.

The French universities are literally and primarily so many faculties, *i.e.* groups of professors. The primary duty of the professor is to advance his subject, and for this reason he gives a course or two every year. They generally take the form of lecture orations to which the public is admitted practically free. Seminar courses are given for the benefit of candidates for the Ph.D. The standard for the doctorate is much higher than that of Germany. Not only the thesis but the oral examination before conferring the doctorate is taken very seriously by all concerned and is generally reported in the *Revue de metaphysique et de morale.*

In France, philosophy is closely associated with psychology, sociology, and the philosophy of law. In no other country is there less pedantry or more scientific spirit in the teaching of philosophy, while attention to clearness and logical form is still maintained.

The Neo-Scholastic philosophy is vigorously developed in the Catholic schools and has several notable periodicals for its organs. It is characteristic of the status of French philosophy that in the Institute of France it is represented in two sections of the Académie des Sciences Morale et Politique.

Philosophy in Other Universities. — French positivism is still a vital force in the teaching of philosophy in Italy, Spain, and Spanish America, especially Mexico. In Italy positivism has to meet not only scholasticism and the native Catholic philosophy (Rosmini, Mamiani, etc.), but also adaptations of German idealism. In Spain and Mexico, however, the issue is sharply drawn between positivism and scholasticism; while in countries like Argentine and Chile, French positivism seems to hold the field.

Philosophy in Secondary Schools. — *In Germany.* — The study of logic, as we saw above, formed part of the curriculum of secondary schools from the very beginning. It was kept in the curriculum of the grammar school by Sturm, Ratke, and Comenius; and Luther, with all his hatred of Aristotle, saw the value of uniting the gospel with the Aristotelian logic as a weapon against the lawless vagaries of the "spiritualists." The *Lehrplan* of Francke (1698) provides for six hours a week of philosophy to prepare students for the university, and in the *selecta* of the Halle pädagogium, metaphysics, and natural law were taught in addition to logic. J. A. Ernesti and Gesner lectured on psychology, logic, natural theology, metaphysics, and ethics, and embodied them in their manuals for secondary schools (1736 and 1756). Frederick the Great and his minister of education, Zedlitz, emphasized the value of logic as an aid to independent thinking. In their school for young nobles they introduced the history of philosophy, natural law, and psychology, which were taught four hours per week for the last three semesters. The breakdown of the Wolffian philosophy through Kant left no settled philosophic doctrines which could be dogmatically taught in secondary schools. Hence philosophy was gradually discontinued, and the original plan of the Prussian gymnasia of 1812 made no provision for it. Repeated complaint, however, was made by the university professors that students coming from gymnasia were entirely unprepared for university lectures on philosophy. In 1825 the minister of education, von Altenstein, after obtaining the opinion of Hegel, issued an order intended to remove this sharp cleft between the gymnasia and the universities. It provided for an introduction to philosophy by means of logic and empirical psychology to be taught two hours per week in the last two years. Systematic philosophy and its history were expressly excluded.

The ministerial order of 1825 did not make the teaching of this philosophic propædeutic obligatory, since teachers were not everywhere available for this purpose. In 1837 the subject was made obligatory on all gymnasia, and it was ordered that teachers of mathematics and physics be assigned to teach it. This last arrangement proved unsatisfactory. Thus the leading and most satisfactory textbook of logic, designed as an introduction to philosophy, was Trendelenberg's *Elementa logices Aristotelica*, which involved difficult Greek. The collapse of the great post-Kantian systems, and the growing contempt for philosophy which characterized the middle of the nineteenth century, caused other studies to crowd out the philosophic instruction. In 1856 the number of hours to be devoted to philosophic propædeutic was reduced to one in each of the last two years, and it was associated with instruction in German. This reduction from the rank of an independent study caused it to be neglected, and in 1882 it was made optional. The official *Lehrplan* of 1891 still considers it important that the student should become familiar with the more important "general concepts and ideas," but German prose readings might serve as the means. The last official order on this point (1901) leaves the situation unchanged. The director may, if he is so inclined and has a suitable teacher, give this course; but the crowding of the curriculum with prescribed work, the general attitude to philosophy, and the difficulty of finding teachers who can teach both German and philosophy has caused the distinctive course in philosophic propædeutic to fall into general disuse in Prussia, Saxony, and other German states.

In Austria, and in some of the southern German states like Baden, philosophic propædeutic is still taught. In Austria it was introduced in 1849 by Exner and Bonitz, who followed Herbart's plan. Psychology, logic, and a little of the history of philosophy are taught two hours per week in the last two years. In Baden, the same order is followed, but the course is reduced to one hour per week. Hungary and the Scandinavian countries, in the main, follow the Austrian system.

In France. — French secondary schools are now no longer regarded simply as preparatory schools, but as schools of liberal culture. Hence philosophy is not taught in them simply as propædeutic, but to provide insight into the problems at the basis of civilization, especially the scientific problems. The basis of the present instruction in philosophy was laid by Cousin, who as minister of public instruction made Eclecticism a sort of state philosophy. The Revolution of 1848 was hostile to this state philosophy, and the reaction which followed was equally so; but Duruy restored it in 1863. Under the Duruy régime philosophy in the lycées included introduction, psychology, logic, ethics, theology, and the history of philosophy.

Under the present arrangement students are divided in the last year into two forms, — the philosophical and the mathematical. The former devotes eight and one half hours per week to philosophy and the latter only three. The official requirements in the former course include (1) introduction to philosophy, (2) analytic psychology, (3) a little of the elements of æsthetics, (4) logic and the methodology of the mathematical, the physical, and the moral and social sciences, (5) ethics, personal and social, and (6) metaphysics, covering the questions of the value and limits of human knowledge, the problems of matter, soul, God, etc. In addition four texts, chosen from a long list of ancient and modern authors, are read and discussed in the classroom, and used as the basis for the exposition of the philosophic systems which they represent.

In the mathematical form, only the logic and the ethics are developed. The close relation between the study of the methodology of the sciences and the student's other scientific studies, makes this course more popular with students than the larger course in the philosophical form. A thesis in philosophy is required for the baccalaureate only in the latter form.

Philosophy in the Secondary Schools of Other Countries. — In Italy the organic law of 1859 (law of Casati, § 188) made philosophy an essential part of the curriculum of the *liceii*. Four hours are now devoted to it in the last year, and the subjects covered are mainly logic and psychology as taught in the French schools. Many, however, are urging its extension. (See *Dizionario di Pedag*, art. "l'Insegnamento della Filosofia.") The French system of teaching philosophy as a branch of liberal culture in the secondary schools is followed, on a somewhat reduced scale, in Argentine and Chile. For the philosophic teaching in the Jesuit schools, see article JESUIT EDUCATION.

M. R. C.

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PHILOSOPHY OF EDUCATION. — Relation of Philosophy and Education. — A clear conception of the nature of the philosophy of education in distinction from the science and principles of education is not possible without some antecedent conception of the nature of philosophy itself and its relation to life. Is philosophy capable of being generated and developed without any reference to education? Then a philosophy of education will be simply the application to educational ideas of an outside ready-made standard of judgment, with all its dangers of forcing the facts of education so that they conform to and support the philosophy already formed. In this case, we shall have as many philosophies of education as are required to illustrate diverging philosophic systems. The case will stand quite otherwise if there is an intimate and vital relation between the need for philosophy and the necessity for education. In this case the philosophy of education will simply make explicit the reference to the guiding of life needs and purposes which is operative in philosophy itself. It will not be an external application of philosophy, but its development to the point of adequate manifestation of its own inner purpose and motive. While different philosophies of education will still exist, they will not be so many corollaries of divergent pure philosophies, but will make explicit the different conceptions of the value and aims of actual life held by different persons. It will be seen that different philosophies exist because men have in mind different ideals of life and different educational methods for making these ideals prevail. The chief point of this article is to develop the conception of the internal and vital relation of education and philosophy.

Every seriously minded person may be said to have a philosophy. For he has some sort of a working theory of life. He possesses, in however half-conscious fashion, a standpoint from which weight and importance are attached to the endless flow of detailed happenings and doings. His philosophy is his general scheme and measure of values; his way of estimating the significance that attaches to the various incidents of experience. If pressed to state and justify his working principle, he might reply that while it would not satisfy others, it served its owner and maker. No individual, however, is so eccentric that he invents and builds up his scheme except on general pattern that is socially transmitted to him. The exigencies and the perplexities of life are recurrent. The same generic problems have faced men over and over; by long-continued coöperative effort men have worked out general ideas regarding the meaning of life, including the connections of men with one another and with the world in which they live. These conceptions are embodied not only in the codes of moral principles which men profess and the religions in which they find support and consolation, but in the basic ideas which have become commonplace through their very generality: such ideas as that things hang together to make a world; that events have causes; that things may be brought into classes; the distinctions of animate and inanimate, personal and physical, and so on throughout the warp and woof of our intellectual fabric. Philosophy aims to set forth a conception of the world, or of reality, and of life which will assign to each of these interests its proper and proportionate place. It aims to set forth the distinctive rôle of each in a way that will harmonize its demand with that of other ends.

Need of a Philosophy of Education. — Three classes of motives, unconsciously blended with one another, usually operate in making the need for systematic and rational ideas felt, and in deciding the point of view from which the need is dealt with. These motives are the conflict of conservative and progressive tendencies: the conflict of scientific conceptions of the world with beliefs hallowed by tradition and giving sanction to morals and religion; and the conflict of institutional demands with that for a freer and fuller expression of individuality. (1) Some philosophies are marked by a reforming, almost revolutionary, spirit. They criticize the world and life as they exist, and set in opposition to them an ideal world into conformity with which the existent scheme of things ought to be brought. Other philosophies tend rather to justify things as they are, pointing out that if we penetrate to their true nature and essential meaning, each class of things is found to serve a necessary purpose and embody a necessary idea. Plato and Aristotle, Fichte and Hegel, for example, are all of them classified as idealists, but the tendency of Plato and Fichte is to set up an ideal over against the actual; while that of Aristotle and Hegel is to exhibit the rational nature or ideal already embodied in the actual — a difference that clearly corresponds to the ordinary division of men into reformers and conservatives.

(2) Different philosophers interpret their material very differently according to the respective weight they instinctively attribute on the one hand to scientific conceptions of the world, and on the other to ethical tendencies and aspirations. If one takes his departure from the former, he will explain men's moral and religious beliefs on the basis of the principles furnished by contemporary science, and will deny the validity of all ideas, no matter how influential in life, that do not harmonize with these principles. To others, men's moral aims and efforts are the most significant thing in life and are taken as the key to the nature of reality. The results of science are reinterpreted to bring them into line. During the rapid development of natural science since the seventeenth century, many philosophies have thus made it their chief business to provide a view of reality in which the seemingly divergent claims and standpoints of natural science and morals should be reconciled.

(3) The third moving force concerns the value attached to the principle of free individuality — individuality that confers upon each person a distinctive worth not supplied by any other person and not capable of being summed up or exhausted in any general formula or principle. Some thinkers start by natural preference with the standpoint of law or a general order, or a pervasive and unifying force. Strictly individual traits are then brought into line by reduction (or at least approximation) to the universal. If individuality is not denied as an ultimate reality, it is explained and justified from the standpoint of a comprehensive uniform principle. Such philosophies tend to be deductive in character and to assign greater value to reason, which deals with general conceptions, than to perception, which reveals particulars. Persons with a strong interest in individuality reverse the standard of value and the method of consideration. Specific individuals are taken to be the primary facts; general principles, laws, classes, are derived from comparison of the individuals or are subordinate to them. In method, such philosophies tend to be empirical and inductive, accepting the observations of sense and the particular situations of conduct as the most certain data, and employing rational conceptions only as secondary means of connecting particulars or filling their gaps.

The totality or completeness at which philosophy aims is not quantitative; it is not the greatest possible sum of accurate knowledge. As to this sort of completeness or wholeness, philosophy cannot compete with the special sciences taken in their totality. For all its special facts, philosophy must depend upon these sciences, and so far as organization of the facts into a larger system of knowledge is concerned it must also walk humbly in the path beaten by science. But there is another kind of unity and wholeness with which science is not concerned: unity of attitude and wholeness of outlook. But wholeness means also balance, interaction, and mutual reënforcement of the various values and interests of life: religion, poetry, industry or the business of making a living, politics or the art of living together, morals, science itself. An account of "experience as a whole" is a conception of experience that shows the special contribution which each of these typical interests makes, and the claim for recognition it may legitimately put forth. The only "experience as a whole" that concerns man is an experience whose parts change continuously, but all change into one another as there is occasion, with ease and flexibility, and so as to enrich one another. Its opposite is not our everyday experience with its fluctuations and its endless running out into the new, but one-sided exaggerations of some phase of this everyday experience, or an isolation of its interests so that they restrict one another, and thus impoverish life.

Philosophy of Education, Science of Education, and Principles of Education. — Education is such an important interest of life that in any case we should expect to find a philosophy of education, just as there is a philosophy of art and of religion. We should expect, that is, such a treatment of the subject as would show that the nature of existence renders education an integral and indispensable function of life. We should expect an interpretation and criticism of the materials and methods currently used in education, using this necessary function as the standard of value. Such a treatment is usually presented under the title of "Principles of Education." While no rigid line marks off this discussion from what is termed the "Science of Education," there are differences of aim and spirit that are worth noting, because of the light they shed upon the nature of a philosophy of education. It is possible to start with education as an established fact, with education as it is currently practiced, and to describe and analyze the various factors that enter into it, factors of school organization and administration, of management and discipline, of instruction and the various branches of study. So far as the analysis reveals general principles of individual growth and of social grouping which are operative in the degree that teaching and training are effective, its result rises above the level of recounting and cataloguing relevant phenomena. Hence it deserves the name of a science. This science affords the basis for a critical comparison of the various processes that are currently employed. As teachers are put in intelligent possession of it, their own work becomes less blind and routine; the science, as in other cases, develops a corresponding art which lifts its practitioners from artisans into artists.

Notwithstanding its intellectual and practical value, such an account of education does not cover the whole ground. It works, so to speak, inside of education as a given fact. Another and larger view is possible and desirable, a less professional and a more human view. Education is a concern not merely of school administrators and teachers, of pupils and their parents, but of society. We may have a definite and systematic knowledge of the principles that are at the bottom of the most effective current practice of the day, and may be able to use this knowledge to criticize and correct defective phases of this practice, and yet be thrown back upon mere opinion or mere custom for a judgment as to the value of an educational system as a whole. The general spirit and trend of an established education might be wrong, and yet make possible a scientific account of itself which would be available for rectifying it in details. But the improvement would still be within a scheme which in its main direction and purport was not what it should be.

We have to judge every educational institution and practice from the standpoint of that "whole of experience" which calls it into being and controls its purpose and materials. There exist not merely the principles by which the existing system of education is made effective, but also the principles that animate the entire range of interests of the whole life of the community and that make the existing system what it is. An interpretation and valuation of the educational system in the light of this inclusive social context is the larger and more human view of which we spoke. It utilizes the contributions of science in all its branches to give society an insight into what sort of thing it is undertaking in the training of its members, and it gives society a clearer consciousness of the meaning of the educational office so largely performed by instinct and custom.

Philosophy is the General Theory of Education. — The connection of education and philosophy is, however, even closer and more vital than this sketch of the principles of education, as distinct from the science of education, would indicate. *Philosophy may be defined as the general theory of education;* the theory of which education is the corresponding art or practice. Three interlinked considerations support this statement: (i) Men's interests manifest their dispositions; (ii) these dispositions are formed by education; (iii) there must be a general idea of the value and relations of these interests if there is to be any guidance of the process of forming the dispositions that lie back of the realization of the interests. (i) If at any time the various values of experience are out of harmony with one another, the ultimate cause of the difficulty lies in men's habitual attitudes toward life: the habits of judging and of emotional appreciation that are embodied in their habits of action. Interests, attitudes, dispositions, fundamental habits of mind are mutually convertible terms.

(ii) If we but consent to extend the term education beyond its narrow limitation to schooling, we shall find that we cannot stop short in this extension till we have broadened it to cover all the agencies and influences that shape disposition. Not merely books and pictures, but the machinery of publication and communication by which these are made accessible must be included — and this means the use made of railway and telegraph as well as of the printing press, the library, and the picture gallery. Ordinary daily intercourse, the exchange of ideas and experiences in conversation, and the contacts of business competition and coöperation are most influential in deciding the objects upon which attention is fixed and the way in which attention is given to them. Every place in which men habitually meet, shop, club, factory, saloon, church, political caucus, is perforce a schoolhouse, even though not so labelled. This intercourse is in turn dependent upon the political organization of society, the relations of classes to one another, the distribution of wealth, the spirit in which family life is conducted, and so on. Public agitations, discussions, propaganda of public meeting and press, political campaigns, legislative deliberations, are in this regard but so many educational agencies. In brief, every condition, arrangement, and institution that forms the emotional and imaginative bent of mind that gives meaning to overt action is educational in character.

(iii) There are but two alternatives. Either these agencies will perform their educational work as an incidental and unregulated by-product, molding men's mind blindly while conscious attention is given to their other more tangible products; or men will have an idea of the results they wish to have attained, will judge existing agencies according as they achieve or come short of these ends, and will use their idea and their estimate as guides in giving the desired direction to the working of these agencies. This brings us, again, to philosophy, which, as we have seen, is the attempt to develop just such an idea. This is what is meant by saying that philosophy is, in its ultimate extent, a general theory of education; or that it is the idea of which a *consciously guided education* is the practical counterpart.

It is, of course, possible to exaggerate the importance of philosophy even when it is conceived in this vital and human sense. Reflection is only one of the forces that move our action, and in the thick of events it gives place to necessities of more urgency. But on the other hand, reflection is the only thing that takes us out of the immediate pressure and hurly-burly of overt action. It is a temporary turning aside from the immediate scene of action in order to note the course of events, to forecast probable and possible issues, to take stock of difficulties and resources, to bring to explicit consciousness evils that may be remedied, to plan a future course of action. Philosophy cannot create values by thinking about them, by defining and classifying and arranging them. But by thinking about them, it may promote discrimination as to what is genuinely desirable, and thereby contribute to subsequent conduct a clearer and more deliberately settled method of procedure in attaining what is desired.

There is always danger that the student of philosophy will become simply a student of philosophic traditions, of something that is conventionally called philosophy but from which philosophic life has departed because the genuine problem in life which called out the formulation has departed from consciousness. When philosophic distinctions are approached from the standpoint of their bearing upon life through the medium of the educational process in which they take effect, the perplexity, the predicament, of life which generates the issue can never be far from recognition.

Relation of the History of Philosophy to Education. — The conception of the intimate connection of philosophy with the fundamental theory of education is borne out by reference to the history of philosophic thought. So far as European history is concerned, philosophy originated at Athens from the direct pressure of educational questions. The earlier philosophy, that of the Greek colonies, was really a chapter in the history of science, dealing with the question how things come to be what they are and how they are made. Then the traveling teachers, known as the Sophists, began to apply its results to the conduct of life, and to use the same methods to discuss moral and social matters. Up to their time, men had attained skill and excellence in the various callings of life and in the business of citizenship through apprenticeship in the customs of the community. The Sophist professed to be able to teach "virtue"; that is, ability in the various functions of life. Some limited their claims to ability to teach the arts of poetry and oratory; others gave instruction in the various industrial arts or in military tactics. Others broadened these pretensions, professing ability to convey power in the management of human affairs, private, domestic, and public. It is impossible to exaggerate the historic significance of these claims. They implied that matters which had always been left to practice, and to practice controlled by the habitudes and ideals of the local community, could be set free from their customary provincial setting and be taught on theoretical grounds, on grounds of intellect. Naturally these pretensions evoked violent protests from conservatives, who felt that the life of the community was at stake. This conflict of devotion to social customs with a reliance upon abstract knowledge provoked the first great speculative issues. What is the real basis of social organization and of moral responsibilities? Do these rest upon custom, upon enactment by superiors, or upon universal principles of nature?

At first these questions were discussed, as was natural, in a casual and superficial way. But Socrates, Plato, and others disentangled the basic questions involved. What is the nature of the state and of law? What is the true end of life? How shall man know this end? Can virtue or excellence be taught? Is it a matter of practice and habit, or something intellectual — a kind of knowledge? If so, what kind? What is knowledge? What is its standard? If virtue can be learned, how is learning related to knowledge?

These questions might be multiplied almost indefinitely, but it is more profitable to note that they tended to group themselves into three main problems: (*i*) What is the relation of knowledge, of reason, to practice, custom, and the opinions that go with custom? (*ii*) What is the relation of human life, especially of social organization and its virtues and responsibilities, to the nature of the universe, of reality itself? (*iii*) What is the relation of change, and of the particular things that change, to the universal and permanent? In a generation or two these questions were largely cut loose from their original connection with education. Their discussion developed into distinct disciplines, often isolated from reference to practical or social matters: into logic, as a theory of knowledge; into metaphysics, as a definition of the nature of things; into cosmology, or a general account of the constitution of nature. But the fact that the stream of European philosophic thought arose out of the discussion of educational ends and means, remains an eloquent witness to the ulterior motive and purport of philosophic reflection. If philosophy is to be other than an idle and unverifiable speculation, it must be animated by the conviction that its theory of experience is a hypothesis that is realized only as experience is actually shaped in accord with it. And this realization demands that man's dispositions be made such as to desire and strive for that kind of experience. The philosophy of education is not the external application to educational affairs of a conception of reality ready made independently of education; it is just the philosophic conception of a balanced and articulated experience stated so as to be available for shaping intellectual and emotional disposition, so that the existence it describes may become a living fact, not the dream of a philosopher's brain.

Problems of Philosophy and of Education the Same. — Since upon education falls the burden of securing the practical realizing and balancing of the various interests of life, the educator faces, if only in half-conscious, unsystematic form, precisely the same questions that philosophy discusses in the abstract. In the attitude taken to matters of hygiene, physical training, manual training, corporal punishment, etc., there will be expressed, for example, some idea of the connection, or lack of connection, of mind and body, an idea that, made explicit and fitted in with other beliefs, corresponds to some typical philosophical theory of the relation of bodily and mental action. Some practices imply that man is an external compound of body and soul, in themselves two independent forces. Others proceed on the assumption that the body is a temporary shell in which mind is housed, or that the body is a clog upon the development of spirit. Other projects imply that only through the adequate functioning of the bodily organs can there be realized a symmetrical and sound mental life. The various theories held by philosophers as to the relation of knowledge to practice are paralleled in educational procedure. Some assume that contemplative knowledge is an end in itself; others, that knowledge is a mere external prerequisite for successful action, success being measured on the basis of material possessions and power; others that knowledge is an intrinsic condition of a practice that is free and full of meaning. In educational discussion, one or other of these ideas appears in some disguised form in every dispute about cultural *versus* professional or vocational education, and shows itself in most debates concerning the relation of the acquisition of knowledge to the formation of character. The old (almost the first) philosophic question as to the relation of the individual to the established objective order appears in instruction as the question of individual initiative and choice over against the accumulated body of organized knowledge which forms the ready-made subject matter of teaching. The philosophical controversy as to the method of knowledge, with its division of camps into sensationalist and rationalist, has a counterpart in the different methods of learning that are encouraged in schools. The philosophic split between mind and physical nature corresponds to the educational antagonism of humanistic and scientific studies, which also has a genuine, even if indirect, bearing upon the philosophic issue of idealism *versus* realism.

To sum up: Various partial tendencies and interests of life are reflected in native homespun intellectual schemes possessed of strong emotional coloring. These are traditionalized; they float, so to speak, upon the institutions of a society, giving them their sanction and explanation. Philosophies in the formal and technical intellectual sense are generated when these traditional systems are subjected to independent intellectual examination with a view to their rational criticism and supplementation. As the more popular schemes express the standard and the subject matter of the educational procedures of a community, since they naturally aim to shape disposition in the continued acceptance of the customary beliefs and ideals, — so the more conscious philosophies can be tested and objectively embodied only as they are made the working bases of educational processes that develop an experience in harmony with themselves. To convince a small number of the theoretical soundness of the philosophy, while men's lives are still ordered in the mass upon quite another basis, furnishes such a contradiction of the claim of the philosophy to evaluate "experience as a whole" as to place the latter in a ludicrous position.

Character of the New Philosophy of Education. — Every generation and period has its own special problems which decide where the emphasis is thrown. When social conditions and scientific conceptions and methods are both in a state of rapid alteration, the tendency to philosophic reconstruction is especially marked, and the need of working out the newer point of view so that it will throw light upon the spirit and aims of education is especially urgent. The present time is characterized by at least three great movements, of which education must take account in the most radical way if it is to bear any relation to the needs and opportunities of contemporary life — and otherwise intellectual and moral chaos must be the result. These movements are: (*i*) the rapid growth of democratic ideals and institutions; (*ii*) the transformation of industrial life — the economic revolution that began in the later eighteenth century with the application of steam to manufacturing and commerce; (*iii*) the development of *experimental* science, culminating in the idea of evolution and the thoroughgoing modification of older beliefs about the processes and organs of life.

(*i*) The democratic movement radically influences education if only because it inevitably produces the demand for universal education. It is impossible that the type of education adapted to the small class in aristocratic and feudal societies, that alone had an opportunity for an intellectual culture, should be adapted to the needs of a democratic society which demands the development of all. By no possibility could the education of a class become the education of all, for a class education is made what it is by the exclusion of most of the people from the opportunities for which it prepares. A democracy, moreover, signifies a social organization which is maintained, upon the whole, by the voluntary wish of the mass of the people, and which is responsive to changes in their purposes. This implies a much greater dependence upon the intelligence and sympathetic good will of all the members of society than is required in communities where authority and precedent are the mainstays of social arrangements. A distinct type of education is demanded to meet the need for individual freedom and initiative combined with respect for others and an instinct for social unity.

(*ii*) The industrial revolution, with the changes it brought about in modes of association, habits of mind, and increase of commodities, is both cause and effect of the democratic development. From every standpoint it exacts modifications of educational ideas and practices. The importance of labor which it proclaims is a note new in the world's history. The effect of the new inventions in eliminating distance and bringing all mankind within the same circle makes interdependence, which had been preached as an ideal, an operative fact. Since the new industrial régime depends upon the application of science to the control of natural forces, men's best and truest knowledge of nature is put in effective circulation. Men's actions are servile or intelligent according as men do or do not have an appreciation of the ideas which govern their occupations. The extreme specialization and division of labor tend to make men simply small parts of the machines they tend, and only the forethought and oversight of education can avert this menace. The multiplication of material goods makes necessary a higher æsthetic taste to prevent general vulgarization. It also affords new opportunities to the masses which they must be educated to take advantage of. Conversely, the luxury and kind of leisure that had been tolerable or even graceful in past régimes becomes a social menace when the social mechanism makes the responsibilities of production and consumption more and more important.

(*iii*) Philosophers have debated concerning the nature and method of knowledge. It is hardly cynical to say that positiveness of assertion on those points has been in proportion to the lack of any assured method of knowing in actual operation. The whole idea and scope of knowledge-getting in education has reflected the absence of such a method, so that learning has meant, upon the whole, piling up, worshiping, and holding fast to what is handed down from the past with the title of knowledge. But the *actual practice of knowing* has finally reached a point where learning means discovery, not memorizing traditions; where knowledge is actively constructed, not passively absorbed; and where men's beliefs must be openly recognized to be experimental in nature, involving hypothesis and testing through being set at work. Upon the side of subject matter, the ideas of energy, process, growth, and evolutionary change have become supreme at the expense of the older notions of permanent substance, rigid fixity, and uniformity. The basic conceptions which form men's standards of interpretation and valuation have thus undergone radical alteration.

Even this bare sketch should suggest the new forces at work in education, and the need of a theory corresponding to the new attitudes and tendencies of our times, if the present situation is to be approached in a spirit of clear intelligence. We need to know the difference that the democratic ideal makes in our moral aims and methods; we need to come to consciousness of the changed conception of the nature of existence that its spread imports. We must reckon intelligently with the new and gigantic industrial forces that have come into being, securing by education a disposition to subordinate them to general welfare and to equality of opportunity so that they may not plunge us into class hatreds, intellectual deadness, and artistic vulgarity. Unless our science is to become as specialized and isolated a thing as was ever any scholastic scheme whose elaborate futility we ridicule, we must make the experimental attitude the pervasive ideal of all our intellectual undertakings, and learn to think habitually in terms of dynamic processes and genetic evolution. Clearness upon the issues, problems, and aims which our own period has brought to the foreground is a necessity for free and deliberate participation in the tasks that present-day education has to perform. Attaining this clearness, with whatever revision of stock notions it may entail, is the peculiar problem of a contemporary philosophy of education. J. D.

For the actual plan of the study of the Philosophy of Education, in the modern curriculum, see Education, Academic Study of.

See also Art of Education; Course of Study, Theory of; Culture; Democracy and Education; Education; Experience; Individuality; Knowledge, etc., and the references there given.

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PHOBIA. — A fear, of the nature of a delusion (*q.v.*), a fixed idea (*q.v.*), or an obsession (*q.v.*). The more common phobias are: pyrophobia (fear of fire), claustrophobia (of closed places), agoraphobia (of open places), and mysophobia (of dirt). S. I. F.

PHONETIC METHODS. — See Reading, Teaching Beginners; Spelling, Teaching of.

PHONETICS. — Judged by its derivation, the word "phonetics" should mean the science of sound. Among teachers of languages, however, it is restricted to the science of speech sounds of human beings. Considered in this manner, phonetics is usually divided into two main divisions: the acoustic and the organic. The former is generally classed with physics, since it concerns the sounds of speech as sounds, independently of their origin or mode of formation. The latter could be classed with physiology (*q.v.*), though it is, generally speaking, given over to students of languages and philology (*q.v.*). It will appear later, however, that experimental phonetics, the most recent of the branches of the science to develop, overlaps these divisions, and is at the same time "physical," physiological, and philological.

Historical. — The earliest studies of phonetics of which we have any knowledge were theoretical. The Sanscrit grammarians seem to have been remarkable phoneticians, as were later the grammarians of Alexandria. It is to the desire of the latter to represent accurately the Greek vowels that we owe the introduction of the accents which enable foreigners to pronounce Greek with less difficulty. The Roman phoneticians, though probably inferior to their predecessors, brought to bear, none the less, on the study of foreign languages, especially Greek, a fund of close observations. These observations, like others by ancient grammarians and phoneticians, frequently enable us to understand just how certain letters were pronounced. Indeed, without these data, philology could not have developed so rapidly and certainly as it has, bringing with it a flood of light concerning the ancient monuments of literature and history, whose country, age, dialect and authorship (single or composite) we are able to establish. This often overlooked side of phonetics — its power to vitalize, to give a soul to, the dead symbol or letter — has led some scholars to divide phonetics into two great divisions: the historical (which we have just mentioned), and the descriptive or modern. History and geography, according to a remark of Louis Havet, bear somewhat the same relation to each other as these two branches of phonetics. Since the latter branch — the descriptive — is for teachers by far the more important, the present article will be devoted in the main to a consideration of this.

Descriptive Phonetics. — The descriptive branch of phonetics involves a minute study of the manner in which the sounds of living languages are produced, the nature of these sounds, and their relation to one another. This minute study makes clear to us, first, the sounds of our own language; secondly, those of other languages. We learn, for example, what distinguishes the *b* of Spanish or French from the *b* of English. By carrying this study through all the sounds of a given foreign language, we are able to pronounce it better and more intelligently, — to speak it with as little " accent " as possible. This being the case, it is evident that descriptive phonetics is of great value to scholars, teachers, students of dialectics, philologists, missionaries, diplomats, interpreters, as well as to the increasing number of persons who realize that, to appreciate the literary beauties of a foreign language, one must be able to read it aloud with a very considerable degree of correct utterance.

Descriptive phonetics is one of the few strictly modern developments of science which are due to the English nation. In fact, the " English school " of phonetics is now the dominant one the world over (leaving aside experimental phonetics, of which more presently). We may therefore omit all further mention of the history of phonetics, and pass immediately to the inception of the " English school," which may be said to have begun with Alexander Melville Bell (the father of Alexander Graham Bell), who published in London, in 1867, a work called *Visible Speech* (second edition, London, 1882). Bell made what may be called an organic study of phonetics; that is, a study of the action of the organs of speech (especially of the tongue) in the production of vowels and consonants. This had of course been done many times before. The originality of Bell lay in his constructing an alphabet in which the form of the symbol should bear some indication of the position of the organs of speech. The mere appearance of the symbol was to tell how the sound was produced. The alphabet which resulted was exceedingly cumbrous, and the scholars who have ever learned to read it or write it are few in number. The importance of Bell's work lay in the impetus which it gave to succeeding scholars. His work suffers from being too theoretical. The name *Visible Speech* is in itself an instance of colossal exaggeration. Fortunately, Bell counted among his immediate followers a few men of practical sense and of sound philological knowledge, the chief of whom was Henry Sweet, professor at Oxford. Sweet and others perfected Bell's alphabet, and carried to a very high point the minute observation of the spoken word. Their study of the tongue positions for the vowels was especially close, for these scholars were Englishmen, and in English the tongue is relatively of great importance while the lip action is reduced to a minimum. Bell, Sweet, and others of the English school established an elaborate system of nomenclature. They spoke of vowels as round or unround; as front, mixed, or back; as high, mid, or low; as narrow or wide. Space is lacking here to explain this terminology.

For a while, there was considerable opposition on the continent to the adoption of the English system. Germany was especially rebellious and scornful. The advance in France was rapid, largely because of the early conversion of Paul Passy. He adopted the English system, with slight modifications, but saw clearly the impossible nature of the Bell-Sweet alphabet. His wide linguistic knowledge (he has spoken from childhood four or five languages) gave him unusual advantages. His most important reform lay in the alphabet. Adopting several letters from A. J. Ellis, the author of *On Early English Pronunciation* (London, 1869), and taking some hints from Bell and Sweet, he perfected little by little what is now called the international phonetic alphabet. As the editor of the *Fonetik Tîtcer* (founded in 1885), which became the *Maître Phonétique* in 1889, he was in a position to offer an increasing publicity to the new alphabet. The *Maître Phonétique* is the organ of the Association International Phonétique, the most powerful and widely diffused linguistic society in existence. As for the alphabet founded by Passy, it is rapidly becoming the phonetic alphabet of the world, and hundreds of treatises employ it. Even Germany has adopted (unofficially, of course) this alphabet for work in phonetics and modern languages.

The following table gives the phonetic symbols and their explanation according to the International Phonetic Association: —

CONSONANTS

The following letters have their usual values **b, d, f, g** (as in *go*), **h, k, l, m, n, p, r** (rolled as in Scotland), **s, t, v, w, z.**

j is the sound of *y* in *yes.*
ŋ is the sound of *ng* in *song.*
θ is the sound of *th* in *thin.*
ð is the sound of *th* in *then.*
ʃ is the sound of *sh* in *show.*
x is a weakened form of the *ch* in German *ach.*
ç is a weakened form of the *ch* in German *ich.*
ʒ is the sound of *s* in *measure.*

VOWELS

i : is the vowel in Modern English *see*, but pure as in the North of England, not diphthongized as frequently in the South.
i is the vowel in Modern English *lip.*
ɛ is the vowel in Modern English *get.*
ə : is the vowel in Modern English *get* lengthened.
æ : is the vowel in Modern English *hat* lengthened.

a is the vowel in French *patte*.
a : is the vowel in the first syllable of *father*, as pronounced in London dialect.
ɔ is the vowel in French *bonne*.
ɔ : is the vowel in French *port* (*i.e.* ɔ lengthened).
u : is the vowel in Modern English *too*, but pure as in the North of England, not diphthongized as frequently in the South.
u is the vowel in Modern English *put*.

When unstressed, the vowels ɛ, a, ɔ are somewhat obscured, that is, they tend towards the neutral vowel heard in the unstressed syllables of *above*, *sofa* (modern pronunciation).

DIPHTHONGS

iu. The sound i: followed by the sound u: the first element being stressed.
ei. The diphthong heard in Modern English *day* as pronounced in the North of England.
ɛu. The sound ɛ followed by the sound u.
ai. The sound a followed by the sound i.
ɔu. The sound ɔ followed by the sound u.
ou. The diphthong heard in Modern English *go* as pronounced in the North of England.
oi. The first element of the diphthong ou followed by the sound i.

The Scandinavian countries were among the first to accept the English school of phonetics. In this connection the celebrated Norwegian scholar Johan Storm, and Otto Jespersen of Denmark, one of the keenest and most original of living phoneticians, deserve special mention. In Germany there are at present probably only one or two phoneticians who refuse to accept the main tenets of the English school. This is largely due to Wilhelm Vietor, who, like Passy in France, has been a potent influence of popularization of the new ideas. The English school, with its terminology, has also spread through the remainder of Europe, and has from the first been virtually the only form of instruction in America (leaving aside, of course, experimental phonetics, as will appear later). If an examination were to be made of the courses now being conducted in phonetics in this country, it would doubtless be found that, except in experimental phonetics, all of the literature used involves an acceptance of the English school. There are, none the less, many teachers of the subject both here and elsewhere who modify considerably the teachings of Sweet and his closest followers, and who do not believe that their system is a finality, because of such considerations as these: like everything of English origin the system is "insular" and lop-sided; it bears the birthmark of claiming too much for itself; it is suspiciously regular and schematic; vowels, for example, to the number of seventy-two appear in perfect regularity, like so many pigeon-holes in an enormous case; the system seems to have been laid out on paper, so much so that a scientist would declare it an admirable example of un-science.

Sound Production. — Before discussing experimental phonetics it will be well to mention briefly the manner in which speech sounds are produced. Speech is the conveyance of thought through sounds produced by modifications of the stream of air which passes from the lungs to the outer air. It is a system of signals which have been agreed upon. If we imagine a person shut up in a windowless tower, but having access to a rubber tube through which water continuously flows from a spring in the tower to the open air outside, it will be apparent that he can devise a system of signals which can convey messages to those without. He can devise a succession of pressures and of stoppages of the tube, and his problem is not unlike that of Morse when he contrived his telegraphic code. Human speech is built on this model. In our case, however, the channel through which the air passes has fortunately a number of stops, of bifurcations, of crooks and corners. These enable us to vary to a large degree the sounds to be produced, so that we dispose of a clear, highly developed code of signals.

Speech Organs. — The main places where the column of air emitted from the lungs is modified in speech are as follows: (The column, of course, moves from within outwards, — towards the listener, — which facilitates the conveyance of signals.) The first modification of the column of air may be produced in the larynx, which is at the enlargement known as the Adam's apple. In this enlargement are two muscles, named erroneously the vocal cords, which can be held apart, as in ordinary breathing, or made to approach each other to any desired degree, even to the point of complete closure. When these muscles are touching loosely, the air may be forced between them by pressure from the diaphragm in such manner that a buzzing, which we call *voice*, is produced. If the buzzing or vibrating column of air meets no appreciable obstruction in its progress to the outer air, the sound is called a vowel; if it meets one or more obstructions, it is called a consonant. There is perhaps no briefer statement possible of the generic difference between vowels and consonants. If we limit ourselves to the ordinary European languages, there is no other place of stoppage or stricture in the passage towards the outer air, until we reach the lower fringe or edge of the soft palate. It is evident that the back of the tongue can rise against this fringe, and, by jerking away just at the instant when the air pressure is at the right degree, cause a consonant sound; or, that the tongue remaining against the fringe, the uvula (the hanging end of the soft palate) may be made to vibrate, as when children "trill" or "gargle." Again, the soft palate itself may be pressed against the wall of the throat back of it, which will close the channel into the nasal passage, or it may hang down somewhat, leaving that passage free. The former is the position of the soft palate for vowels (except, of course, nasal vowels, such as exist in French, Portuguese, and American English), and for the oral (that is, non-nasal) consonants. If now we consider the vault of the mouth, beginning just above the fringe of the soft palate and extending to the front upper teeth, we realize that the tongue can touch any part of this surface. In fact, the majority of consonants are produced against this vault. It is unnecessary to name these consonants, since any one can experiment for himself. It should, however, be remarked that the tongue is able to execute quite a varied system of "signals." It can stop the passage entirely, as in *g*, *k*, *d*, *t*, or nearly stop it, as in the initial consonant of *yes*, in that of *she*, in the consonant of the German word *ich*, etc. It can make its tip vibrate, as in a lingual *r*. Again, it is clear that the upper teeth offer a convenient place of partial stoppage, as in *th*, *f*, *v*; and, finally, that the lips can offer stoppage, as in *p*, *b*, *m*.

Experimental Phonetics. — Such being briefly the physical facts, phoneticians attempted to contrive instruments which would record the movement or action of the various organs. The result is the most recent development of the subject, — namely, experimental phonetics. This branch of phonetics arose in France, in a committee appointed in 1874 to examine into the possibility of employing instruments in phonetic research. The committee received encouragement from Étienne Marey, the ingenious physiologist of the Collège de France, some of whose apparatus proved of great value. One member of the committee, Dr. Rosapelly, a physician of Paris, invented several instruments of the highest utility, such as: the *trembleur*, which records, by means of an electrical connection, the vibrations of the larynx; instruments for registering the vertical movement of the larynx in speaking or singing; for recording the passage of air through the nose; for the vertical movements of the lips. Dr. Rosapelly, however, forced to give most of his time to the practice of medicine, did not long continue his career as a phonetician. His work was taken up in 1885 by the Abbé Rousselot, who then made the acquaintance of Rosapelly, Marey, and of the skillful constructor, Charles Verdin. From that time to this, Rousselot has not ceased to devote himself with enthusiasm and patience to the new science, and is considered its founder. His laboratory at the Collège de France has been and still is the best in the world, and his publications, which began in 1890, have been numerous. He has perfected several inventions of others and contrived some of his own. His pupils are numbered by hundreds and have carried his principles into many countries. His most brilliant pupil in France has been A. Zund-Burguet, who has invented several ingenious and valuable instruments. The largest courses in experimental phonetics (general phonetics as well) are those conducted by Professor Rosset in the summer school at the University of Grenoble. Hundreds of students from a score of nationalities gather here every summer for the subject. The first instrument having an application to phonetics which was invented by an American was the phonograph of Edison (1877), an instrument which is simply a perfection of the phonautograph of a French printer, Scott de Méninville (1859). The first work in experimental phonetics as such appears to have been done by Professor C. H. Grandgent, who published in 1890 an article on *Vowel Measurements* (*Publications of the Modern Language Association*). Professor Raymond Weeks contrived in 1890 an artificial vowel rounder, and later an instrument for recording the movements of the soft palate, an instrument for the vibrations of the larynx, the spirograph (which writes the varying pressure of the air in the mouth during speech), and a perfected apparatus for the movements of the lips. Professor F. M. Josselyn published, beginning in 1899, some valuable work on Italian phonetics. Professor E. W. Scripture has done exhaustive work in the tracing and study of speech curves.

There is great need of an extension of the teaching of phonetics in American institutions of learning. Not only would this aid in making philology more vital, but it would prove of the utmost value to teachers of elementary English. Strong courses should be established in all summer schools, where the eager and conscientious public school teachers would assimilate rapidly the new and vivifying knowledge of phonetics. R. W.

See Modern Languages, Teaching of; Philology.

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The best constructors of instruments for phonetics are G. Boulitte, 7, Rue Linné, Paris; and R. Montalbetti, 28, Rue Gay-Lussac, Paris.

PHONIC METHOD. — See Phonetic Method.

PHONOGRAMMIC METHOD. — See Reading, Teaching Beginners; also Phonetic Method; Spelling, Teaching of.

PHONOGRAPH. — See Musical Instruments, Mechanical, in the School.

PHONOGRAPHY. — See Commercial Education; Secretarial Profession, Education for.

PHRASE BOOK. — See Commonplace Book; Dictionaries; Latin Grammar; Teaching Apparatus.

PHRASE METHOD. — See Reading.

PHRENOLOGY. — A pseudo-science which attempts to discover the mental characteristics of the individual through an examination of the external configuration of the skull. This science was first suggested by F. G. Gall (1758–1828). It was afterwards developed by Spurzheim and others. Gall examined a large number of persons and noted their special mental characteristics as well as the configuration of their heads. His attention was especially drawn to persons of marked characteristics, such as he found in the prisons and hospitals. A man who had been confined because of his tendency to steal was evidently an interesting character for Gall, because his mental traits were clearly defined by his misdemeanors. Comparison of a number of individuals who were of this marked type led to a mapping of the outside of the skull and the designation of the various regions of the brain to which certain mental faculties were supposed to be related.

There can be no doubt that such investigations as these stimulated a discussion of the relation between mental characteristics and the development of the central nervous system. Indeed, certain enthusiastic writers have regarded Gall as the father of the modern science of cerebral localization. Gall undoubtedly suggested the possibilities of such a science, but he is in no wise responsible for the technique which was later developed and which put the whole matter on a definite scientific basis. In the form in which Gall projected the science, it was hopelessly involved in two fundamental errors. In the first place, his subdivision of mind into certain faculties was grossly inadequate. To assume that discrimination of color is a separate mental faculty, or that the faculty of reverence or veneration can be distinguished as a separate mental characteristic, shows the crudity of the psychological analysis on which phrenology is based. As a matter of fact, each of these functions is a composite including certain forms of perception, and certain forms of ideation. With the development of modern psychology, the classification of faculties proposed by phrenology has come to be entirely untenable. In the second place, it has been shown conclusively that the external configuration of the skull is no indication of the internal form of the cerebrum. Furthermore, the cerebrum has been mapped out by thoroughgoing scientific methods in such a way as to show that the localization of functions depends upon an entirely different physiological structure from that which is assumed in the phrenological system. We may therefore say in general that with the advance of physiological knowledge the anatomical assumptions of the phrenologists have also become entirely untenable.

The pseudo-science, as cultivated to-day, is commonly employed for charlatan purposes. The practitioner announces that he is able to describe to the individual his capacities for future training and occupation. Such guesses as he is able to make with regard to the individual's characteristics are derived from a general inspection of the individual rather than from reference to the external configuration of the skull. C. H. J.

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PHYLOGENY. — The term employed to designate the evolution of a race or species. It is distinguished from ontogeny, which refers to individual development as contrasted with racial development. C. H. J.

PHYSICAL DIRECTOR. — See Physical Education.

PHYSICAL EDUCATION. — **Historical.** — In time past and in our own time physical education has been exalted, tolerated, neglected, or denounced, according to the prevailing conceptions as to the nature of the human body and of its relations to the human mind. The character of these conceptions has depended chiefly on the ideals of human excellence held at different periods in the history of education. Those ideals, according to Hartwell, may be characterized as the Greek or æsthetic, the monkish or ascetic, the military or knightly, and the modern or scientific.

The Greek ideal recognized the unity or symmetry of body and mind as expressed by Plato in the *Timæus*. "Everything that is good is fair, and the fair is not without measure. Now, we perceive lesser symmetries and comprehend them, but about the highest and greatest we have no understanding, for there is no symmetry greater than that of the soul to the body. This, however, we do not perceive, nor do we allow ourselves to reflect that when a weaker or lesser frame is the vehicle of a great and mighty soul, or, conversely, when a little soul is incased in a large body, then the whole animal is not fair, for it is defective in the most important of all symmetries; but the fair mind in the fair body will be the fairest and loveliest of all sights to him who has the seeing eye." Gymnastics were accorded a large and important place in the educational program of Greek youths. The teaching of gymnastics afforded positions of honor and emolument to distinguished and ambitious men. Bodily training furnished themes for poets, philosophers, and historians; sculptors and painters sought models in the gymnasium, and Greek physicians studied and adopted exercises and procedures originated by teachers and gymnasts. In the breadth and sanity of its aims, the completeness of its development as a national institution, and its abiding influence upon succeeding generations, Greek physical education has no parallel. (See GREECE, ANCIENT, EDUCATION IN.)

The ascetic ideals of the monks, which after the first few centuries of the Christian era exercised a profound influence upon European thought and life, was the antithesis of the Greek ideals of education. The conception that the soul and the body are independent and mutually antagonistic entities was responsible for the complete abandonment of physical education by the monks. They believed that all flesh was the creation of Satan and that spiritual health was best subserved by self-torture and bodily weakness. The influence of the monks continued to antagonize and retard bodily training in education until the beginning of the nineteenth century. (See MONASTICISM AND EDUCATION; MIDDLE AGES, EDUCATION IN.)

The military or knightly ideal of human excellence existed side by side with the ascetic ideal of the monks. It played a conspicuous and important part in the education of the sons of noblemen and gentle folk. The young knight was trained to ride, draw the bow, use weapons, and hunt; some attention was given to manners, but very little to letters. The aim was the development of efficient soldiers and gentlemen. This form of education was popular in England and the Continent until the seventeenth century. (See CHIVALRIC EDUCATION; GENTRY AND NOBLES, EDUCATION OF.)

Modern Views. — The modern or scientific ideal of physical education owes its origin to the belief " that to work the mind is also to work a number of the bodily organs, that not a feeling can arise, not a thought pass, without a set of concurring bodily processes." The sciences of biology, physiology, and psychology have furnished a basis for the study and application of the laws governing the growth, development, and education of the body and mind. Man's knowledge of himself has been immensely increased and his conception of nature and his place in nature radically changed. One of the most prominent results of the progress made in these sciences is a deeper appreciation of the vital importance of motor training in education.

The modern or scientific ideal of physical education recognizes two chief aims: (1) health, normal growth and development of the body as an efficient organism; (2) psychomotor education, with emphasis on bodily control and the expression of personality or character of the individuals.

These ideals are based on the sciences of biology, physiology, psychology, and education, but physical education itself has not yet attained the dignity of a definite science. Since the somewhat crude attempt of Ling (*q.v.*) early in the nineteenth century to devise a system of gymnastics based on physiology and coördinated with educational procedure, much progress has been made in placing physical education on a scientific basis. During the period of evolution from crude empiricism to scientific principles, physical education has passed through many phases.

Three distinct systems originated in Europe and developed simultaneously; the Swedish system of educational, military, and medical gymnastics devised by Ling and his followers; the German system of gymnastics developed by Guts Muth, Jahn, and Spiess (*qq.v.*); and the British scheme of athletics and games fostered and developed in the universities and public schools. (See ATHLETICS; GYMNASTICS.) The Swedish and German systems had for their chief aim the training of strong, self-reliant, and patriotic citizens. The athletics and games of England developed naturally in response to the normal play instinct of English boys and young men.

These well-defined national schemes for physical education have survived to the present day and spread to many lands. The Delsarte system of exercises was devised by François Delsarte (*q.v.*) in Paris, about 1840, to train actors in dramatic expression. The Delsarte plan had such a limited scope that it could not gain recognition as a system of physical education.

In Colleges and Universities. — In the United States physical education had no place in our schools and colleges until the latter part of the last century. Before 1860 the population was very largely rural, the school terms were short, and a large proportion of the children obtained physical vigor and psycho-motor training from participation in the varied activities of the rural home. The need for systematic bodily training in the schools was small and its importance not recognized. A few sporadic attempts were made by educational reformers to arouse interest in some phase or other of physical education, but without success. One of these attempts, the introduction of German gymnastics by Dr. Charles Beck, at the Round Hill School Northampton, Mass., in 1823, attracted considerable attention for a few years. The New York High School and the colleges of Harvard, Yale, Amherst, Williams, and Brown followed in 1825, 1826, and 1827. Dr. Follen (*q.v.*) and, later, Dr. Francis Lieber had charge of gymnastic instruction at Harvard College and the Boston Gymnasium. The enthusiasm then aroused by the new movement was not permanent; by 1830 physical education had been discarded as a passing fad.

During the period 1830–1850 physical education was completely neglected. The decade 1850–1860 marks the beginning of the modern revival of interest in athletics, gymnastics, and hygiene, which after twenty-five years of slow growth has since developed into a large and important phase of modern education. The nascent interest in gymnastic and athletic forms of exercise during this decade was promoted by the newly established intercollegiate contests in rowing; the organization of gymnastic societies (*Turnvereine*) by political refugees from Germany who came to this country after the revolution of 1848; the lectures and exhibitions of Dr. G. B. Windship, who advocated heavy lifting; the introduction of calisthenics (*q.v.*) by Dr. Dio Lewis; and the prominence given to topics relating to physical education by speakers at teachers' conventions and institutes, by editors of educational journals, and by public school officials.

Gymnasiums were built at Harvard, Yale, and Amherst colleges in 1860, and in the same year. Amherst organized the first college department of hygiene and physical education, with gymnastics as a compulsory branch of college work. The example of Amherst was not followed to any extent by other colleges until after 1885, but since that time the extension of the movement has been very marked, as shown by the following figures for 124 of the leading colleges in 1910: —

	Per Cent
Colleges having organized departments of Physical education	84.3
Colleges having gymnasiums	98.2
Colleges having swimming pools	36.6
Colleges having athletic fields	95.8
Colleges having tennis courts	97.6
Colleges having regular instruction in gymnastics	94.7
Colleges having prescribed courses in physical education	87.1
Colleges giving credit towards bachelor's degree for courses in physical education	58.2

Title of Officer in Charge of Department of Physical Education

Professor	21
Associate or Assistant Professor	4
Director of Gymnasium	38
Physical Director	20
Instructor	17
Colleges in which officer in charge of department of physical education has a seat in the faculty	75.7

Courses in physical education are prescribed for freshmen only in about one fourth of the colleges, for freshmen and sophomores in about one half of the colleges, and in about one fourth of the colleges the prescription is for three or four years. The usual credit for each year is two units or about one sixtieth of the total required credits for the bachelor's degree.

The following description of the course prescribed for freshmen in Columbia College shows in a general way what is usually taught in a college physical education course meeting two hours a week for one year: —

(1) Physical and medical examination, 1 hour; (2) instruction in track and field athletics (outdoors), 12 hours; (3) instruction in marching and gymnastics, 34 hours; (4) instruction in hygiene (lectures, etc.), 6 hours; (5) instruction in swimming, until qualified. Examinations are held and students graded as in other subjects.

The typical department of physical education in the American college includes three distinct lines of activity: (1) The gymnasium and accessories, such as swimming pool, rooms for handball, boxing, fencing, wrestling, etc., in which physical education courses are conducted and the mass of students meet for general exercise; (2) the care of the students' health, which includes medical examinations, consultations, medical and surgical treatment, and instruction in hygiene and sanitation; (3) organized athletics, including intracollegiate and intercollegiate contests in the various games and sports. The forms of organization and methods of administration vary over wide limits in the colleges, but there is a marked tendency towards concentration of all the physical education, athletic and health supervision activities in one department, under the direct control of the college authorities. In this respect American colleges and universities are far in advance of similar institutions in other countries where the health, physical education, and recreations of the students are not regarded as matters for which the institutions are responsible.

In Schools. — In the private secondary and preparatory schools, physical education is organized much the same as in the colleges. The importance of motor education, health supervision, and moral education during the adolescent period is generally recognized by educators in the secondary schools. All the large schools and most of the smaller ones have well-organized departments of physical education in charge of professionally trained directors. The first attempt to include physical education in the program of the public schools was during the decade 1860–1870, when the calisthenics advocated by Dr. Dio Lewis had a wave of popularity. The interest lasted only a few years and physical education was again neglected until the decade 1880–1890, when a number of Western cities with a large German population introduced light gymnastics of the German type in the public schools. The growth of cities, industrial development, and the rapid expansion during this period were factors in arousing the interest of educators and the public to the importance of providing physical training for the children in the schools. The city homes could not furnish the necessary environment for the normal physical development and motor training of the growing generation, and the need of modifying the school curriculum to meet the new conditions was recognized. In 1889 a conference in the interest of physical education took place in Boston. The conference was presided over by United States Commissioner of Education William T. Harris, and addresses were made by prominent educators, physicians, and specialists in physical education. The purpose of the conference was to " place before educators different systems of gymnastics and to secure discussion of the same, with a view to ascertaining clearly the needs of schools, and determining how they may best be met." A direct result of the Boston conference was the organization of a department of hygiene and physical training and the adoption of the Swedish system of gymnastics in the public schools of Boston. New York and many other cities soon followed, with the result that by 1900 nearly all the cities in the East, Middle West, and West had some form of physical education in the school program. The most common system of gymnastics in use in the school is the Swedish, or some modification of this system. A few large cities, particularly in the Middle West and Southwest, have adopted the German system.

Special directors and teachers are employed for physical training in about half of the cities where this subject is taught. The most common form of organization is a department with a director of physical training for the city, special teachers in the high schools, and supervisors in the elementary schools, who visit each class once or twice each month to criticize and help the grade teacher. The athletic activities of the school boys were developed by the boys in many cities without direction or supervision from the school authorities. Since the organization of the Public Schools Athletic League the school authorities in many cities have taken control of this important phase of physical and moral education.

Training of Physical Instructors. — The rapid growth of physical education in the schools and colleges since 1885 has been due in large measure to the development of professional schools for the training of teachers and directors of this branch of education. Between 1880 and 1900 six normal schools and as many summer schools were established for the training of physical education teachers. The course of study in the normal schools extended over two years, including courses in anatomy, physiology, histology, kinesiology, anthropometry, hygiene, history of physical education, methods and practical work in gymnastics, athletics, and dancing. Since 1900 three of the normal schools have lengthened the course to three years, and in two of them the course leads to the bachelor's degree.

The rapidy increasing demand for teachers and directors of physical education with a good general education and professional training has led a number of colleges and universities to establish professional courses in physical education. These courses are usually open to students who have completed two years of college work. The professional courses extend over two years and lead to the A.B. or B.S. degree.

In addition to a good general education and professional training, a medical education is considered essential for directors of physical education in colleges, secondary schools, and the public school systems of large cities. The character and personality of the teacher or director are even more important than his education and professional training. He comes in closer contact with a larger number of students than any other school or college officer. He advises students in matters of exercise and hygienic habits. He influences the ethical amd moral standards of the students in games and athletic contests. Only men and women of high ideals and deep human sympathy are qualified to assume the responsibilities of directing the physical education of school and college students. G. L. M.

Other aspects of the subject are treated in greater detail under ATHLETICS, EDUCATIONAL, and the various articles on HYGIENE. See also the articles on the various educational games and sports.

PHYSICAL EXAMINATION. — See MEDICAL INSPECTION OF SCHOOLS.

PHYSICAL GEOGRAPHY. — See GEOLOGY; GEOGRAPHY.

PHYSICAL SCIENCE. — See CHEMISTRY, PHYSICS, etc.

PHYSICAL TESTS AND EXAMINATION. — See MEDICAL INSPECTION.

PHYSICIAN, SCHOOL. — See MEDICAL INSPECTION OF SCHOOLS.

PHYSICS. — **Historical Development.** — Physics has been a subject of study in universities ever since their rise in the thirteenth century. Before 1600, however, the official text was the *Physics* of Aristotle, and work in the classes consisted mainly of scholastic disputations on the contents of that work.

During the two centuries (1450–1650) in

which the experimental method of investigation was slowly winning recognition, the nature of the university study of physics gradually changed. The magnitude of this change may be measured by comparing the physics of Aristotle with that of Galileo (*q.v.*). The former is static, seeks final causes, and finds them by classifying phenomena by genera and species, using in this classification not the whole phenomena with its progressive changes, but some one of its static aspects which has been arbitrarily selected as expressing the nature of things. For Aristotle the stone falls because it belongs to the class of objects whose natural condition is one of rest on the earth. The physics of Galileo makes no effort to study final causes, but merely recognizes that the longer the stone falls the faster it moves; and seeks by measurement to determine whether there is any constant relationship between the time of fall and the velocity acquired. This method is dynamic, since it takes account of the constant changes of phenomena and enables us to control and to predict them.

Because modern physics consists of two parts, namely, (1) mathematical discussion based on (2) observation and measurement, these two have of necessity developed side by side in the growth of the science. They have not, however, always been equally emphasized. In the early stages of growth the experimental side has been more prominent; while in the later stages the mathematical analysis has assumed the more prominent position. Thus in static electricity, Gilbert (1600), Gray (1730), Von Kliest (1745), Franklin (1747) — all observers and experimenters — preceded Cavendish (1773) and Coulomb (1785), who put the science on a mathematical basis. In current electricity, Galvani (1780) and Volta (1800) discovered how to make electricity and sought to find out what it would do before Ohm's law (1827) and the Wheatstone Bridge (1843) ushered in the quantitative treatment. Galileo made thermometers (1593), Watt patented his steam engine (1769), and Rumford (1798), Mayer, and Joule (1842) published their celebrated observations before Kelvin (1848), Clausius (1850), and Rankine (1850) traced the mathematical consequences. The observations and measurements of Oersted (1819) preceded the mathematical treatment of electromagnetism by Ampère (1823); and Faraday, the keen observer (1831), preceded Maxwell (1873), the mathematician.

As in the growth of the science itself, so in the teaching of physics in the universities, the emphasis has fluctuated between the mathematical and the experimental aspects. At the time of Newton and for some time thereafter, the mathematical treatment was most prominent. Mersenne's *Opera* (1644), Barrow's *Lectiones Opticorum* (1669), Keill's *Introductio in veram Physicam* (1739), and Newton's *Principia* itself are evidence of this. For there was at that time no chance for students to work in laboratories, and even class experiments were practically unknown.

During the latter half of the eighteenth century demonstration lectures at the French Academy became very popular in Paris, and, as is well known, the popular demonstration lectures of Sir Humphry Davy at the Royal Institution in London (*q.v.*) were the inspiration of Faraday (*q.v.*) and started him on his great career. Thus while experimental work necessarily precedes mathematical discussion in the early growth of the science, it seems to have been introduced into teaching because of a popular demand for it.

In Universities and Colleges. — In the university teaching, the emphasis remained on the observational and experimental side from the end of the eighteenth century nearly to the end of the nineteenth century (1890), as is shown by the common use of such books as those of Ganot and Deschanel as texts, — books in the early editions of which there is practically no mathematical work. Since 1890 mathematical work has been rapidly introduced into the teaching. This was a necessary result of the introduction into the courses of individual laboratory work by the students, and of the development of the spirit of research at universities. At present the emphasis, both in the laboratory work and in the theoretical discussions, is very decidedly on the mathematical side. No one can advance beyond the first year of college work in physics unless he has mastered the calculus. In many of the current courses in mechanics, thermodynamics, and optics it is often hard to realize that there ever was an observational and experimental side.

In America the first laboratory teaching of physics to college students was done by E. C. Pickering at the Massachusetts Institute of Technology in 1869. Since that time it has been gradually introduced into all college courses. These courses have also been expanded enormously, owing to the very rapid growth of the science itself. The result of this has been that students who wish to become specialists in physics now have to pass through four or five years of formal training in the technique of laboratory manipulation before they are admitted to original research. The great physicists of to-day were submitted to no such formal training. Whether the present formal system will produce greater scientists than did the rather informal training of the past, remains to be seen.

The changes that have taken place during the last fifty years in the methods of teaching physics in colleges and universities are the necessary accompaniment of the development just presented. For college work the standard texts at the beginning of this period were books like those of Arnott, Ganot, and Deschanel. These are largely descriptive of phenomena and processes. At present the college texts, like those of Hastings and Beach, Carhart, and Watson, bristle with algebraic symbols and geometrical diagrams. In the older books phenomena usually preceded explanation, while at present definitions, axioms, and laws generally come first, with phenomena dragged in reluctantly at the end in the rôle of applications. Then men were engaged in solving the problems of nature, and students were interested in learning about it; now the student must first learn the man-made definitions and laws and then be shown that nature observes them. The most recent texts show a marked tendency to treat phenomena before laws, and to justify definitions by facts before stating them.

The philosophy of physics has changed much in the past century, but the teaching of it has been slow to follow. In the early part of the past century matter and motion were the controlling ideas; hence all courses began with "properties of matter" and discussions of motion. This is still the customary order, although the doctrine of energy is now the central idea in physics. Physicists have, during this last century, known that laws are but statements of constant relations among measured quantities, and that these laws are true only in so far as further measurements verify them. The majority of college students seem, however, still to get the impression that the laws of physics are true in the absolute sense, — that they express truths that are absolutely true beyond and outside of human experience. This fallacy persists among the students because the current emphasis on mathematical treatment gives to the subject an air of finality which is not properly its own.

In the European universities physics is now taught mainly by demonstration lectures. The type of lectures given is well shown in books like Kundt's *Vorlesungen über Experimentalphysik*, or Pellat's *Cours de Physique.* It does not differ materially from that given in American colleges in their first courses in physics. The time devoted to the course is usually one hour daily for two semesters.

Laboratory work is required only of those who are specializing in physics, medicine, or engineering. The laboratory course or *practicum* for these specialists usually takes two three-hour periods a week for two semesters. The grade of work done is well set forth in the well known manual of Kohlrausch. After completing these one-year lecture and laboratory courses, the student of physics is at once admitted to research work.

In Secondary Schools. — *The United States.* — In the secondary schools of America physics, under the name of natural philosophy, was one of the subjects included in the course of study from the very beginning. Since both the academies and the public high schools were founded to meet a public need for an education of a more practical kind than that given by the colleges, natural philosophy was taught in them for the value of its information. The people were living in the beginnings of the age of steam and machinery, and they were eager to know something about physics. The early books and courses, therefore, contained no mathematics and much discussion of everyday phenomena and experience.

The early work from 1780 down to 1825 usually consisted in the study of and recitation from a text. In 1827 the city of Boston equipped its schools with some "philosophical apparatus" for experiments by the teacher or by teacher and class together. Laboratory work by the pupils was practically unknown until after 1865. In 1880 the United States Bureau of Education reported but four schools that were giving a full year of physics with laboratory work by the pupils; 53 that were giving experiments by the teacher, and 113 that were giving mere textbook instruction.

In 1872 physics came on the list of subjects accepted for admission to Harvard College, but no laboratory work was required. Arnott was mentioned as the book defining the requirement. The Harvard *Descriptive List* of laboratory experiments required for entrance credit in physics at Harvard appeared in 1887. The influence of this list was strengthened by the report of the Committee of Ten (1895), and by that of the Committee on College Entrance Requirements (1899) of the National Education Association. Following the adoption of this latter report, several apparatus companies put on the market relatively inexpensive sets of apparatus with which all the experiments called for by the report might be made. As a result of all this, the introduction of laboratory work into high school physics has continually progressed until such work is now given in practically every school where physics is taught at all.

While this development of laboratory instruction in physics was taking place, the methods of treating the subject changed rapidly. In 1882 Gage issued his book which bore the motto, "Read Nature in the Language of Experiment." This book is typical of the work done at that time. In the introduction to the Harvard *Descriptive List* (1887) it is stated that the experiments therein described were selected with a view to their having the greatest practical utility in the thought and actions of educated men. In the report of the Committee on College Entrance Requirements (1899) the same set of exercises is said to be designed to give the pupil a "comprehensive and connected view of the facts and laws of elementary .physics." Thus it was during this period that "utility to men" was eclipsed by "the logical development of the laws of physics."

This general change in the point of view is evident from a study of the changes that have taken place in the content of the texts intended for school use. The descriptions of machines, daily experiences, and familiar processes, which were plentiful in the days of Natural Philosophy, now give place to more quantitative material, like Newton's laws of motion, the absolute system of units, and instruments for accurate measurement. The 1882 edition of Gage makes no mention of the dyne and the erg as units of force and work. In the edition of 1888 these units are introduced in fine print. In the older books we find many statements like this: A cannon ball that weighs 10 pounds and is moving with a velocity of 100 feet per second has a momentum of $10 \times 100 = 1000$. No units of momentum are specified. This sort of vagueness as to units has largely disappeared, though there are still books which say that the acceleration of gravity is 980 centimeters.

The increasing recognition of the importance of quantitative work in physics has been a mark of real progress. It was, however, carried too far, with the result that in most schools a pupil was introduced into physics through micrometer calipers and the absolute system units. It was the logical method to proceed from the simple to the complex, and what simpler beginning could be found than the gram mass, the centimeter, and the second. Under the desire for logical rigor, the subject matter was organized about the system of absolute units and the effort made to teach physics in this way.

This eclipse of the needs of youth by the science of physics was coördinate with and dependent upon the similar changes that took place in the college world, as described above. While Ganot gave way in the colleges to the *University Physics* of Carhart and the like, Gage yielded in the high schools to texts claiming logical order, mathematical treatment, and up-to-dateness as their chief virtue. The inevitable result has followed. Physics is generally regarded by the high school pupils as a subject to be avoided if possible. In 1900 most of the colleges specified physics as a subject that must be presented for college entrance. Now few, if any, make this a specified subject. It was dropped from the list of specified subjects largely because the number of students who were conditioned in physics at entrance to college became large, owing to a decrease in the number of students who took it in the high schools.

Present Movement. — During the past ten years a decided reaction has been developing against the so-called logical methods of treating physics in high schools. This reaction took an organized form in the National Commission on the Teaching of Physics (1906), which was appointed by the coöperative action of a number of associations of science teachers. The work of this commission culminated in the definition of the unit in physics adopted by the North Central Association of Colleges and Secondary Schools in 1907. This definition is noteworthy for its brevity and for the complete absence from it of all demand for abstract mathematical work. In 1909 the College Entrance Examination Board adopted a new definition of its requirement in physics. This definition was framed by a committee of six secondary school teachers without assistance from the colleges, and warns teachers against the disguise of unfamiliar units.

Physics teachers are now working, through several committees, on the problem of bringing their work close to the pupils by using in their classes problems and apparatus such as the pupils meet in their daily lives. This is a complete reversal of the methods of a few years back. Then it was considered necessary to present definitions and general principles first, and to bring in the home experiences and familiar machines only by way of illustration or application. Now the pupil begins by a study of some particular familiar thing, — a water motor, a hoisting crane, a gas stove, an electric bell, — and is led thence to the formulation of the principles involved.

Europe. — In the secondary schools of France and Germany physics is taught in small doses extending over a long period. The pupils in the scientific courses carry the subject during the last five years of their work, — two hours a week for three years, and then three hours a week for two years. This is equivalent to a little more than two units in the American system, but its extension over five years has obvious advantages in the way of allowing the difficult concepts of physics to develop slowly in the pupils' minds. Outlines of the work done in these five years are given for Germany in Gutzmer, *Die Tätigkeit der Unterrichtskommission der Gesellschaft deutscher Naturforscher und Aertzte* (Teubner, 1907); and for France in the *Plan d'Etudes et Programmes d'Enseignement* (Paris, Hachette). The total ground covered in these courses is a little more extended, but not very different from that which many American high schools attempt to cover in the time of one unit.

It has been noted that students abroad enter research after the equivalent of three units of training in physics. This again raises the question whether the four or five years of preliminary training required in America is a benefit to the students or not.

The foreign secondary schools are considerably behind the schools of the United States in the development of individual laboratory work in physics. It is only during the last eight years that serious attention has been given to this matter. Much progress has been made in this short period, and at present laboratory work by the pupils is being rapidly introduced everywhere. The kind of work done is practically the same as that done in America under the standardized system of the national physics course. A reaction against this formal and logical method is also well under way in Germany. From many sides the demand for more practical and vital work is heard. The term *Arbeitsunterricht* has there come into prominence of late.

Elementary Schools. — In the elementary schools physics has received relatively little attention. During the early years of their development (1820–1870) some little work of a descriptive character was attempted; but from 1870 to 1900 very little effort was made to teach physics in any form in the grades. In 1895 the Committee of Fifteen on Elementary Education recommended to the National Education Association that *one full hour a week* be devoted to science during the whole eight years of the course, and that in the seventh and eighth grades the time be devoted to physics and chemistry. This recommendation, as far as physics was concerned, was not followed eagerly by the schools as a whole. The nature study movement was just beginning to develop, and its emphasis was on physical geography and the biological sciences.

In some few places, notably in New York City, a serious attempt has been made to develop a course in physical science in the seventh and eighth grades. In that city in 1903 a new plan of nature study was adopted. A syllabus was issued according to which the work of the seventh and eighth grades was to be a complete course in elementary physics. The aim of this course is not only to acquaint the pupil with the fundamental laws and principles of physics, but also to train him in habits of close observation, accurate thinking, and correct expression; in short, the emphasis is on physics as a well-organized mass of knowledge and on mental discipline, rather than on the need of the child. This course occupies two forty-minute periods a week. Laboratory work has been introduced, in which the pupil does set experiments and writes them up in his notebook. The method of presentation recommended is: (1) presentation or demonstration by the teacher; (2) individual laboratory work by the pupils; (3) recitations on the demonstration and the laboratory work. The kind of laboratory experiments recommended are: (1) those that verify laws demonstrated by the teacher; (2) those that are wholly or largely quantitative in character; (3) those that will impart a certain degree of mechanical skill. It is claimed that this work also fosters in the pupils the scientific habit of mind. Notwithstanding this effort in New York City and elsewhere, the teaching of physical science in grade schools has not made much progress in the country at large.

Another type of work in physical science in the seventh and eighth grades has recently been developed in experimental schools like that of the Teachers College in New York and that of the College of Education of the University of Chicago. A practical problem is presented to the class, such as: Is it cheaper to make a still and distill water on a gas stove than it is to buy distilled water from the druggist? The pupils construct stills, measure the gas consumed in distilling a measured quantity of water, and compute the cost per gallon. This type of work creates a lively interest among the pupils. It makes no pretense of logical order or rigorous treatment. Its chief aim is to teach the children to analyze familiar phenomena and to solve by the method of science simple and real problems in physics which yet lie well within the range of their daily experiences. The child and his needs are the center of the course rather than the organized science of physics. Courses of this kind have not yet been organized with sufficient definiteness to make them available for use in city school systems; nor has an adequate supply of teachers competent to carry on work of this kind successfully been forthcoming as yet.

The general lack of work in the physical sciences in the grades has led recently to a demand for a course in " general science " in the first year of the high schools. Physiography is usually given in the first year in the secondary schools, and many claim that it serves the purpose of opening the eyes of the pupils to the importance and the interest of further scientific study. In many cases, however, physiography has become too much specialized to serve the purpose of a general introduction to science. Courses in general science have, therefore, been organized in numerous places, which usually consist of a series of topics and problems such as: How are grease spots most easily removed from clothes? What are the conditions for making good pictures with a pinhole camera? How do spectacles improve eyesight? Which kind of gas burner is most economical? What are the traps on the waste pipes of sinks for? How is water purified? Numerous first-year courses of this general type have been developed in secondary schools. In most of the places where the experiment has been tried, it is pronounced a great success in increasing the general interest of the pupils in science and in swelling the numbers of those who take the later more advanced courses in physics. The courses that have been arranged differ widely as to content. There is as yet no general agreement either as to content or as to the organization of it. The entire movement is still in the experimental stage, but it shows very clearly an effort to develop a type of science teaching which shall make the needs of the pupils rather than logical organization the controlling element in the work.

The justification of the new methods of treating physics is readily found in the history of physics, in the recent analysis by the psychologists of the doctrine of formal discipline, in the present demands of the people for the development of social and industrial efficiency in education, and in the recent developments of the philosophy of science.

C. R. M.

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PHYSIOGNOMY. — See Lavater, J. K.

PHYSIOGRAPHY. — See Geology; Geography.

PHYSIOLOGICAL AGE. — A term which refers to stages of development and is, therefore, to be distinguished from chronological age, which refers to the calendar of years and months. The succession of the stages of development, maturity, and senescence form the calendar to which any living individual may be referred for designation as to physiological age. It is held that the statement of the stage of development is more fully descriptive of the individual than is a statement of years and months of age, alone, for the former gives information as to structural condition, physical and mental abilities, characteristic of the stage, while the latter refers only to length of life. Owing to different rates of development, chronological age gives imperfect information as to actual mental or physical status.

The physiological calendar of developmental stages is a series of anatomical, physiological, and mental signs which serve as data for reference. This has given rise to the additional terms "anatomical" and "psychological" age, depending upon the nature of the sign noted for reference. Of the former, Rotch has presented a series of developmental epochs based upon the appearance of the ossification centers of the bones of the wrist; of the latter Binet and his followers have presented a series of tests of mental abilities. These signs vary in significance as to the number and closeness of their correlations with other important features of development. Of the least importance at present are the anatomical signs of earlier tooth appearance and the development of the bones of the wrist, for with them little correlation with other features of maturation has been determined. Of greater importance are the signs of puberty and menopause with which many significant qualities are closely correlated. At puberty, of which pubic pubescence is the sign, the voice changes, a growth acceleration begins, physical proportions change, many mental abilities wax and wane, and the whole social attitude changes.

Strength of grip, right hand. Stage of pubescence of a group of 662 high school boys between 14.5 and 15 years of age.

1. *Prepubescents.*
2. *Pubescents.*
3. *Postpubescents.*

Kilos	Physiological Age		
	1	2	3
15–19	3	2	2
20–24	17	22	16
25–29	34	52	41
30–34	26	49	79
35–39	15	22	113
40–44	1	7	78
45–49		1	43
50–54			21
55–59			12
60–64			2
65–69			2
70–74			0
75–79			1
80–84			1
Number	96.	155.	411.
Average kilos	29.37	30.79	38.80
Variability	4.96	5.66	8.46

Since puberty may occur at any age between six and twenty, and commonly from eleven to sixteen, the mere statement of a chronological age, as, for instance, thirteen years, gives no information as to whether or not these most significant changes have or have not occurred; while the statement of physiological stage with reference to pubescence will more accurately describe the individual.

We divide children from eleven to sixteen into three classes — prepubescents, pubescents, and postpubescents, according to the absence, first appearance, and evident presence of pubic hair. The preceding table illustrates the fact that postpubescents are much stronger than prepubescents. Similar investigations determine that they are proportionately taller and heavier, and that their success in school and their growth rates are also very different.

Owing to the fact that this thesis is new, the physiological calendar is incomplete, and the significance of each of its data of reference has not been fully stated. The importance of basing education upon the observed succession of developmental stages, instead of the chronological basis, has become apparent, and efforts have been made to bring about the change. The recognition of the fact that the neuromuscular abilities of the postpubescent boy are superior to those of the prepubescent boy has led to a classification for purposes of athletic competition upon the basis of weight, which is closely correlated with pubescence, and in many cases the division is made upon the actual observation of pubescence.

The following table, taken mainly from Boas, exhibits the anatomic and physiological development calendar as it is at present formulated. The corresponding psychological calendar is at present unformulated.

Objective Sign		Average Date	Variability (Sigma)
Pregnancy	♂♀	0.0	.04
First incisors	♂♀	0.6	.21
First molars	♂♀	1.6	.31
Inner permanent incisors	♀	7.	1.6
Inner permanent incisors	♂	7.5	1.4
Outer permanent incisors	♀	8.9	2.1
Bicuspids	♀	9.	2.8
Outer permanent incisors	♂	9.5	2.1
Bicuspids	♂	9.8	1.6
Permanent canines	♂	11.2	1.4
Permanent canines	♀	11.3	1.
Second molars	♀	12.8	1.6
Second molars	♂	13.2	2.
First stage pubescence	♂	13.5	1.6
Second stage pubescence	♂	14.7	1.7
Puberty	♀	14.9	2.01
Wisdom teeth	♂	19.3	2.1
Wisdom teeth	♀	22.	1.8
Menopause	♀	44.5	5.3
Death due to arterial diseases	♂♀	62.5	13.2

♂ male; ♀ female.

C. W. C.

PHYSIOLOGICAL PSYCHOLOGY. — See Psychology.

PHYSIOLOGY. — That phase of biology which treats of the functions or life activities of animals and plants. General physiology deals with fundamental processes which are common to all organisms. The terms animal physiology and plant or vegetable physiology are commonly applied to the subdivisions which treat of life processes in animals or plants, respectively. (See Biology; Botany.) Human physiology in the strict sense is the science of human functions; and it is chiefly a division of animal physiology, for the comparative study of animal life has contributed numerous facts and principles applicable to the human aspect of the science. Human physiology is popularly more or less confused with hygiene, probably because personal hygiene is largely an application of physiology supplemented by some applied bacteriology. Public hygiene, on the other hand, depends primarily upon applied chemistry and bacteriology in the public control of conditions which affect the health of communities. Having now defined the field of physiology as a subscience of biology, an outline of its various relations to education will be more intelligible.

In Universities and Medical Schools. — Only in advanced courses in some universities and medical schools is human physiology presented as a separate branch of science, while the necessary facts of anatomy and histology are taught in prerequisite courses. More commonly, college courses and large textbooks which are designated " physiology " contain a large admixture of anatomy, chiefly microscopic, but sometimes gross also. Moreover, in some colleges there are no announced courses of physiology, but the human side of physiology is presented as a culmination of general biology.

In Schools. — With reference to schools of secondary and elementary grade the term " physiology " has been very loosely used, especially in America, and has been applied to various courses of study of the human body, some of them based on textbooks with less than 10 per cent of their pages devoted to physiological topics. In defense of the use of the word " physiology " for such elementary studies of the human body, it has been urged that the whole study revolves around functions; and the same kind of argument might also justify the more recent use of " hygiene," for such studies as are of value chiefly with reference to health. Numerous authors of elementary textbooks have avoided such unwarranted use of the term physiology by adopting such titles as " human anatomy, physiology, and hygiene," " human mechanism," and " human body and health."

Instruction concerning the human body, and especially aiming at health, is in many states required by law in the six or seven years between the second grade of the primary school and the second year of high school. (See Temperance, Instruction in.) In most cases the laws do not specifically require anatomy and physiology, but obviously some fundamental facts in these lines are necessary as a scientific basis for teaching hygiene. The general tendency of recent years has been to reduce the amount of human anatomy and physiology in elementary courses for public schools, in order to make way for more hygiene, particularly the problem of germ diseases. There is excellent authority for teaching in elementary schools only as much physiology as is needed for application in hygiene and only as many facts of anatomy as are useful in physiology.

The most recent movement affecting public school "physiology" is the attempt to make it an integral part of nature study for elementary grades and of general biology, or sometimes zoölogy, courses of high schools. The elementary school adjustment to nature study has been studied in only a few schools, although advocated by many prominent science teachers. (See Nature Study.) The inclusion of high school physiology and hygiene in biology courses is very common in many high schools, and is officially recognized in courses of study in some states, notably New York. Practically all prominent teachers who have tried presenting human physiology and hygiene in connection with high school biology favor the plan because so much of the usual studies of animals and plants helps to interpret human structure and functions. In fact, the only possibility of teaching physiology and hygiene on the laboratory basis is by making use of illustrative materials selected from the fields of botany and zoölogy.

In some systems of elementary schools and in a few high schools the teaching concerning the human body has been designated hygiene and placed in the charge of teachers of physical training. The experiment has been far from successful, chiefly because hygiene is best taught by classroom and laboratory methods and with illustrative materials which are quite foreign to the standard physical training. Moreover, there are relatively few possible correlations between hygiene and physical training outside of breathing and muscular activity. Probably most useful of all elementary hygiene is that relating to food and germs, and these certainly have no relation to physical training. On the other hand, they are natural applications of biological nature study and high school biology. M. A. B.

For more detailed presentation of the educational status of the entire subject, see Hygiene, Personal; Hygiene, School; Hygiene, Teaching of; Physical Education; Temperance, Instruction in; also Nature Study; Medical Inspection; Sanitary Science; Sex Hygiene.

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See also reference lists under Hygiene.

PIANO PLAYING, HYGIENE OF. — See Desks and Seating; Manual Training, Hygiene of; Overpressure.

PIARISTS. — A teaching order established by Joseph Calasanctius (1556–1648), a Spanish priest, who was born near Petralta in Arragon and after studying at Lerida, Valencia, and Alcalá proceeded to Rome. Here he was struck by the lack of educational opportunities for the poor, and with the aid of two priests opened a free school in 1597. The work grew rapidly and further assistance was obtained. In 1606 there were 900 pupils under instruction; in 1613 there were 1200. In 1621 Pope Gregory XV permitted the establishment of a teaching congregation — *Congregatio Clericorum regularium pauperum Matris Dei Scholarum piarum,* known also as the *Patres piarum Scholarum.* After much opposition and internal troubles the order was once more confirmed by Pope Clement IX. The members wore a habit much like that of the Jesuits, whose general organization was also copied in the main. The Piarists undertook primary education — *ad majus pietatis incrementum.* From Rome they were soon invited to other parts of Italy and then Spain. In 1631 they took up work in Moravia; in 1640 in Bohemia; in 1642 in Poland; and after the Thirty Years' War in Austria. In the eighteenth century and in the early part of the nineteenth the Piarists were particularly influential in Austria and Hungary, especially after the expulsion of the Jesuits. Besides elementary education they had been allowed by Pope Clement XII in 1731 to give higher education, and they established many higher schools. From 1804 to 1849 they had charge of the *Academia Theresiana* in Vienna. Throughout the latter half of the last century, however, there has been a decline in the activity of the Piarists in Austria. Their chief centers are now in Italy, Spain, and America. While they followed a scheme very similar to the *Ratio* of the Jesuits, they did not adhere to it so rigidly; nor were they so narrowly classical as the Jesuits. They divided the school work into nine classes: reading, writing, ciphering, *schola parva* or *rudimentorum, schola principiorum, grammatica syntaxis humanitas* or *poesis,* and *rhetorica.* To avoid fatigue school work was never continued beyond periods of three days. The work of the congregation is organized in provinces. At the head stands a *Præpositus generalis* with four assistants and a *Procurator generalis,* all in Rome. The chief authority in each province is the *Dicasterium provinciale*; the head of a college is the *Rector*; of a settlement, the *Superior.* A general chapter takes place at

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PICCOLOMINI, ÆNEAS SYLVIUS. — See ÆNEAS SYLVIUS.

PICO DELLA MIRANDOLA. — See RENAISSANCE AND EDUCATION.

PICTOGRAPHS. — See LANGUAGE, WRITTEN.

PICTORIAL METHOD. — See READING.

PICTURES. — See VISUAL AIDS.

PIERPONT, JOHN (1785–1866). — Textbook author; graduated at Yale College in 1804. For five years he was teacher in the academy at Bethlehem, Conn., and private tutor in South Carolina. He studied law at Litchfield, Conn., and practiced a few years at Newburyport, Mass. He then took the course in theology at the Cambridge Divinity School and devoted the remainder of his life to the ministry. He was the author of a series of school readers, including the well-known *American Class Book* (1831). W. S. M.

PIERSON, ABRAHAM (1645–1707). — First president of Yale College; graduated from Harvard College in 1668. He was ordained to the ministry, and was assistant pastor (under his father) at Newark, N.J., and pastor at Killingsworth, Conn. He was the first rector of Yale College (1701–1707). He published an Indian catechism and a work on natural philosophy, which was studied in the college for many years. "He was an excellent scholar, a great divine, a faithful preacher, and wise and judicious in all his conduct." W. S. M.

See YALE UNIVERSITY.

PIETISM. — A movement which occurred within the Lutheran Church in the seventeenth century, stimulated by the opposition to the formalism and intolerance in the dogma and practice of the church. The result of the Thirty Years' War had been to establish a number of "little popes," each with his own official clergy to protect an intolerant creed. Theological quibbling on questions of doctrine, a cold, logical, and intellectual religion, had sprung up, and close adherence in forms was demanded. Against this condition came a movement for practical Christianity, pious conduct, and faith; the heart rather than the intellect was the seat of religious beliefs. Philip Jacob Spener (1625–1705) is generally regarded as the leader in the movement. He had, however, several predecessors whose work tended in the same direction. Among these may be mentioned Johann Arndt, Johann Valentin Andreas (*q.v.*), and Balthasar Schuppius.

Pietism was a demand for the expression of piety and devotion in individual action; conduct was to be inspired by inner light, deep reverence, and true conception of religion. Hence there followed naturally love of God and love of man; the spiritual and the social went together. To pietism in no small measure was due the humanitarian and philanthropic activity of the eighteenth century.

Strong as the influence of pietism was in religion, it was even more powerful in education. Both Spener and Francke held that the faults of the age were due to bad upbringing of children in home and school, and to poor teaching. They recognized the evil of allowing the memory to run ahead of intelligent comprehension, and further they saw the defects of an education which stressed verbalism and neglected the real and practical. As in religion the chief cause of prevailing conditions was a divorce between doctrine and practice, so the remedy in education was to be found in a combination of the word and the thing. But the leaders of the movement also realized that the benefits of education were confined to only a few. The lower classes, the poor and destitute, were almost entirely neglected. Accepting the theory of the total depravity of children, the pietists were compelled logically to accept and provide education as a discipline for the conduct of life. The result of the two views on the function of education was to relate knowledge to the needs of life, a life directed to higher ends — love of God and human sympathy. Thus a change in the curriculum in the direction of the modern and practical was no longer impossible. From the social-philanthropic aspect a new movement began for the provision of schools for orphans. As Spener was the leading influence on the religious side, so Francke (*q.v.*) was the moving spirit on the educational. All the implications which flowed from the pietistic movement were realized in the great *Stiftungen* of Francke at Halle (1695). Throughout Germany this influence was felt almost immediately, and led to the establishment of schools for the poor and to the foundation of orphanages. Connected with these went the training of teachers, also in imitation of Francke's system. At Halle, too, was established the first "real" school by Semler in 1706, based on the principle *non scholæ sed vitæ discendum.* Although this school did not meet with success, it was the prototype of the "real" school established by J. J. Hecker in Berlin in 1747 and so of the "real" schools of Germany. Through Hecker the stamp of pietism was also laid upon Prussian elementary education, for he was in large part responsible for the *Generallandschulreglement* of 1763. But the influence of pietism which thus emphasized the value of the vernacular did not end with the elementary and secondary schools. Through Spener, Francke, and Thomasius (*q.v.*), after the failure of the two latter to introduce the use of the vernacular at the University of Leipzig, the University of Halle (*q.v.*), probably the first modern university, was established.

As a religious movement pietism, like other similar movements, at times degenerated into fanaticism, and while it had originated to vindicate human values, it ended in decrying every thought and action in the slightest degree worldly. In education, however, it laid the foundations of modern ideas: an increased importance was attached to the vernacular; the "real" studies were encouraged; practical needs were not disregarded; better methods replaced the old emphasis on discipline and memory; schools were provided for the lower classes; "real" schools were introduced; and teachers began to be trained. Nor were these influences confined to Germany. The Moravians (*q.v.*), a direct offshoot of the pietist movement, established schools as soon as they were organized. In England the charity school movement (see Charity Schools) was due to similar influences; in England and America the Quakers were an equally important factor in the development of education (see British and Foreign School Society; Friends, Education of Society of; Lancaster, Joseph, etc.); while similar movements, almost contemporaneous with pietism, led to educational reforms in France. (See Christian Brothers; La Salle, St. John Baptist de; Port Royalists.)

See Francke, August Hermann, and the references there given.

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PIKE, NICHOLAS (1743–1819). — Author of one of the earliest popular American arithmetics; was graduated at Harvard College in 1766. He taught for several years and in 1788 published his *New and Complete System of Arithmetic*, which for nearly half a century was in general use in America.

W. S. M.

PILLANS, JAMES (1778–1864). — Scotch educator, born and educated in Edinburgh. He graduated M.A. at the Edinburgh University in 1801; for several years he was a private tutor at Eton, and from 1810 to 1820 he was Rector of the Edinburgh High School. As Rector he met with considerable success, increased the number of pupils, and introduced the monitorial system for the first time in a secondary school. He was especially interested in the teaching of Latin, Greek, and ancient geography. His experiment at the high school attracted much attention, particularly in France, where he was made a member of the *Société pour l'Enseignement élémentaire.* In 1820 he was appointed to the chair of Humanities and Laws, a position held by him until 1863. Professor Pillans had an intimate acquaintance with all types of school in England, Scotland, Prussia, France, Switzerland, and Ireland. In 1856 he published a volume containing most of his writings on education under the title *Contributions to the Cause of Education.* The speeches and essays are characterized by breadth of view and are the fruit of wide educational experience. Professor Pillans was a warm supporter of the professional education of teachers and of the improvement of their social status. Professional education he did not consider to lie in higher education or a training in devices and methods, but in principles and psychological foundations of education. He urged the establishment of chairs of education in Scotland as early as 1828, and continued advocating these to the end of his career.

See Education, Academic Study of.

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PISA, UNIVERSITY OF. — See Italy, Education in.

PITCH. — The quality of a tone. The tonal range of the normal ear extends from the lowest audible tone, about twelve vibrations per second, to the highest audible tone, about fifty thousand vibrations per second. The lower limit is usually determined by means of large tuning forks, and the upper limit by means of a Galton whistle. The range is greatest in early youth. The upper limit is lowered with age to such an extent that at sixty a person may not have more than about two thirds of the range he had at sixteen. Sometimes gaps occur within the tonal range, *i.e.* a person is incapable of hearing tones of a certain pitch, although he may hear both higher and lower. This is analogous to color blindness.

C. E. S.

See Ear; Sound.

PITTSBURGH, UNIVERSITY OF, PITTSBURGH, PA. — The oldest existing institution of learning west of the Alleghanies. It was first chartered on February 28, 1787, as Pittsburgh Academy; later, in 1819, as the Western University of Pennsylvania. In 1908 the title was changed to University of Pittsburgh. In 1822 the first college faculty was installed. By state appropriation the first college building was erected. Fires in 1845 and 1849 destroyed the buildings. In 1866 the University acquired the Allegheny Observatory, and new buildings upon the observatory site in Allegheny were completed in 1890. In 1908 a new site was chosen, consisting of forty-three acres in the Oakland district. By 1912 five buildings had been completed on this site. The Chancellors of the University, at first called principals, have been as follows: Robert Bruce, 1819–1843; Heman Dyer, 1843–1849; D. H. Riddle, 1849–1855; John F. McLaren, 1855–1858; George Woods, 1858–1880; Henry M. MacCracken, 1881–1884; Milton B. Goff, 1884–1890; William Jacob Holland, 1890–1900; John Alfred Brashear, 1901–1904; Samuel Black McCormick, 1904–. The purpose of the second charter, to create in western Pennsylvania a university similar to the University of Pennsylvania in the east, was partially carried out from 1840 onward, in the establishment of courses in law, in advanced English, in engineering, in astronomy, and in medicine. In 1892, under the chancellorship of Dr. Holland, this purpose was fully realized in the establishment of schools of medicine, law, dentistry, pharmacy, and mines. All these are now located on the university site, with the exception of the observatory (situated permanently in Riverview Park), and the schools of law and pharmacy, which will shortly be transferred.

The University of Pittsburgh now consists of eleven schools, as follows: college, engineering, astronomy, graduate, mining, economics, education, medicine, law, dentistry, and pharmacy. It is managed by a self-perpetuating Board of Trustees, consisting of thirty members, together with the Chancellor and the mayor of the city. The entrance requirements are the usual fifteen units. The school of medicine requires two years of college work. Entrance to the law school is determined by the rigorous requirements in that profession in Pennsylvania, the student body for the most part holding bachelor's degrees. In the year 1911–1912 the faculty of the University consisted of 271 members. The students numbered 2258, distributed as follows: graduate school, 68; college, 345; engineering, 176; mines, 46; economics, 425; education, 502; law, 170; medicine, 190; pharmacy, 200; dentistry, 165. The University has (April 1, 1912) assets amounting to more than two million dollars. Its support comes from private endowments, individual gifts, and biennial appropriations from the state.

The location of the University in the world's greatest industrial center gives prominence to certain of its departments. Among these are medicine, with the splendid hospital facilities; engineering, with its unrivaled laboratories in the mills and manufactories, which make possible the new coöperative system whereby engineering students gain practical experience while engaged in study; research work in industrial chemistry, with the system of industrial fellowships, which are rapidly multiplying; economics, sociology, etc., courses in which are extending with rapidity and effectiveness; education, with its plans for coöperating with the public school system in western Pennsylvania. S. B. M.

PLACE, FRANCIS (1771–1854). — Publicist and educationist. He was born in a "sponging house," or private debtor's prison, in Vinegar Yard near Drury Lane, London, his father, Simon Place, being a bailiff to the Marshalsea Court. Afterwards the father took a tavern, and Francis was brought up with arab-like street life out of school, and actually taught other pupils in school. From 1784 to 1789 he was apprenticed to a leather-breeches worker. In 1791 he married Elizabeth Chadd, when their joint earnings amounted to seventeen shillings a week. With a period of unemployment in 1793 he became overseer of parish scavengers, but notwithstanding every discouragement he gave himself up to intellectual improvement by borrowing books on loan. By 1796 he had become an agnostic, and took part in publishing Tom Paine's *Age of Reason.* In 1799 he opened a shop as a tailor, determined not to exercise the ordinary tricks of tradesmen. Place came into contact with Joseph Lancaster (*q.v.*), sent a son to one of his schools, and endeavored to make the movement, not only a charitable plan for the children of the poor, but the basis of an organization of a complete system of primary and secondary education, at least for London, and was one of the pioneers in the movement of "Schools for All." One of Place's distinctive suggestions was a system of higher schools in connection with the Lancaster Society, so as to help the middle classes as well as the poor. He was particularly anxious, like Ellis (*q.v.*) later, that systematic courses of morals should be included in the curriculum. Bentham offered a site for such a school, and the proposed curriculum was founded on the *Chrestomathia* of Bentham (*q.v.*). James Mill joined Place in drawing up the proposed plan in 1815, but the scheme finally failed in 1820. In 1823 Place was instrumental in founding a London Mechanics Institute (*q.v.*), which was further developed by Dr. Birkbeck (*q.v.*), and which with day classes attached has become one of the most important recognized "schools" of the University of London. Place advocated, at the beginning of the nineteenth century; schools for all, buildings to be erected at the cost of public authorities, compulsory rates for education, and good teaching on a strictly non-sectarian basis. He was a leader against the laws forbidding combinations of workmen, and was an important source of information on social questions for the first half of the nineteenth century, having left seventy-one volumes of manuscript and materials, largely autographical, now placed in the British Museum Library. F. W.

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PLAMANN, JOHANN ERNST (1771-1834). — German educator, born in Berlin and there educated at the Royal Real School and the Joachimsthal Gymnasium. After studying theology and pedagogy at Halle, he was private tutor for a time, until he became so full of enthusiasm for Pestalozzi's work that he decided to visit him in Switzerland. He remained at Burgdorf from May to October of 1803 and was in intimate touch with Pestalozzi. On his return he opened a Pestalozzian institute in Berlin with royal authority. The first effort failed, owing to trouble with the school authorities. In 1805 Plamann opened another school on Pestalozzian lines and met with great success. This institute became the center of Pestalozzianism in Prussia. The authorities encouraged young teachers from all parts of Prussia to visit Plamann, and Von Humboldt sent his son to the school, through which he was converted to Pestalozzianism. Among the future educational leaders who received their training through Plamann may be mentioned: Harnisch, Jahn, Kawerau, and Dreist. Plamann visited Pestalozzi a second time in 1812. Plamann was the author of several books on the Pestalozzian system: *Einzige Grundregel der Unterrichtskunst nach Pestalozzis Methode, angewandt in der Naturgeschichte, Geographie und Sprache* (*Some Principles of the Art of Instruction according to Pestalozzi's Method applied to Natural History, Geography, and Language*, 1805); *Anordnung des Unterrichts für ein Pestalozzische Knabenschule* (*Course of Instruction for a Pestalozzian Schools for Boys*, 1806); *Elementarformen, Sprach- und wissenschaftlichen Unterrichtskunst* (*Elementary Methods of Instruction in Language and Science*, 1906); *Beiträge zur pädagogischen Kritik; zur Vertheidigung der Pestalozzischen Methode* (*Contributions to Educational Criticism, in Defense of the Pestalozzian Method*, 1815).

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PLANCHETTE. — See Muscle Reading; Automatograph.

PLANS, LESSON. — In order to train teachers to anticipate and prepare for all the essential demands that will be made by the conditions of the classroom and the standards of effective teaching, it is customary to require the preparation of lesson plans by students of the teaching process. At first such plans are usually for a single lesson period; later, they may cover a group of lessons; later still, with more experienced teachers, a scheme of procedure for the work of a month or a term. A common type of lesson plan makes a preliminary statement of aims (for both teacher and pupils), and then in parallel columns suggests the *subject matter* and *the method of procedure* to be utilized in developing the lesson.

The advantage of the lesson plan lies in its usefulness as a device: — (1) in anticipating the situations which are to be used in controlling the experiences of children, (2) in stimulating the teacher to an adequate gathering of the materials which are the basis of instruction, and (3) in defining the teacher's activities so as to avoid discursiveness. Mechanically used, the lesson plan tends to make teaching formal and inflexible. It should be used as a guide (rather than as a fixed plan), elastic enough to be modified to meet the unforeseen situations and spontaneous interests that constantly appear in every classroom. Fullness of detail in such careful advance planning is requisite for beginners in order to clarify the teacher's thinking and to give a basis for advance criticism on the part of the supervisor. More schematic planning covering wider units is more profitable for experienced teachers in service, inasmuch as they have in large degree perfected their scholarly and pedagogical resources, and have attained an easy self-command in the classroom. For trained teachers, a demand for detailed written plans may prove wasteful of time and energy. H. S.

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PLANTA, MARTIN (1727-1772). — Swiss educator born, at Süs in the Grisons and educated by his brother. After studying theology at Zürich, he was tutor for a time in Germany and then (1750) pastor of a German congregation in London. Here he also studied mathematics and physics, to which he contributed several inventions. Returning to Switzerland, he became pastor at Zizers in 1754. In 1761, after consulting the French Minister Ulysse de Salis-Marschlins, the diet of Grisons, and members of the *Société Helvétique*, he with a friend, J. Peter Nesemann, a former pupil of the Franckesche Stiftungen, opened a school, the *Séminaire* or *Séminar*. This was soon transferred to Haldenstein and met with great success, attracting foreign as well as native pupils. The aim of the school was "first to give a Christian education, and secondly to prepare pupils for the various careers, political, administrative, military, and commercial." The curriculum was broad and included: Latin, French, German, history, geography, law, natural law, practical mathematics, bookkeeping, design, music, and drawing. Mechanical methods were replaced by attention to individuality, appeal to the intelligence, and independence. Ulysse de Salis-Marschlins in a tribute to Planta referred to the following features in the school: "Self-government of the pupils as a stimulus to ambition and preparation for a republican life, the Socratic method, and the religious foundation." The school was organized on the model of the Roman republic. Emphasis was placed upon physical exercise, including gymnastics and excursions. The pupils were encouraged to make collections of minerals, plants, and insects, and were also taught manual work of different kinds. In 1771 the school, having now ninety-six pupils, was once more moved to the castle of Marschlins. About this time, too, Planta designed to open a free school for poor pupils of ability. On Planta's death in 1772, K. Fr. Bahrdt, a disciple of Basedow (*q.v.*), was given charge of the school, now known as a *Philanthropinum*. But Bahrdt did not have the personality to carry on the school with success, and it was closed in 1776.

See PHILANTHROPINISM.

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PLANTS, PROTECTION OF. — See GARDENS, SCHOOL; NATURE STUDY; also HUMANE EDUCATION.

PLANUDES. — See MAXIMUS PLANUDES.

PLASTICITY. — Modifiability. That property of living organisms which enables them to adapt their behavior to changes in their environment. The term may also be applied widely to cells of which the organism is composed or even to non-living matter that retains the modifications which result as a consequence of action upon it. The term is generally used, however, in connection with those changes which are clearly adaptive.

Under the condition of rapid changes in environment any animal species which is plastic will have an advantage over those which are not capable of modifying their behavior to suit the new conditions. According to the theory of organic selection the presence of plasticity serves to modify the influence of natural selection by enabling the animal possessing it to form new habits suitable to the changing environment, which promote the survival of the animal until natural selection has time to secure more fundamental adaptation.

According to this view, therefore, in a species which survives because of its plasticity, each individual will require education in order that it may be brought into harmony with its environment. Man's nervous system is preëminently the most plastic of all animals' by virtue of the comparatively large size of his cerebral hemispheres. Corresponding to this fact we have the lengthened period of infancy, which is the period devoted to the learning of new modes of behavior. Man is, therefore, comparatively much less dependent upon instincts and reflexes than the lower animals and much more dependent on habit, making education a virtual necessity. The human nervous system becomes much less plastic in middle and old age, as shown in the relative difficulty in learning new habits both of thought and action. E. H. C.

See ACQUIRED CHARACTERISTICS; INFANCY AND EDUCATION; HEREDITY.

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PLATEAU. — See HABIT; also LEARNING; PRACTICE CURVE.

PLATO. — The educational influence of Plato is so all-pervasive that it is impossible to give an adequate statement of it, even had the subject not been treated under a variety of other topics. In the general article on GREEK EDUCATION it is the ideas and influence of Plato that are expressed for the most part in the discussion on the THEORY OF GREEK EDUCATION (Vol. III, pp. 153–155). Again, in the article on IDEALISM AND REALISM IN EDUCATION (Vol. III, pp. 371–375) it is chiefly Plato's influence which is discussed. In the article on ETHICS, on LOGIC, on PHILOSOPHY, and especially in PHILOSOPHY OF EDUCATION, it is again Plato's influence which is stressed as fundamental. In the articles on MYSTICISM and NEOPLATONISM his influence during the late classical and medieval periods is considered. Throughout the entire list of topics relating to the philosophy of education (see ANALYTICAL INDEX in the last volume), Plato's influence is to be noted, especially in such articles as those on KNOWLEDGE, IDEA, LAW, etc. The following article, therefore, is limited to a brief statement of the chief points of Plato's influence on education. The Platonic schools of education, as worked out in an ideal system, are found in their most systematic form in *The Republic*. As stated above, these accord in general with the most advanced educational theory of the Greek people. In a similar way, Plato's most concrete statement of educational practices, as found in *The Laws*, is in general a transcript of contemporary Greek practices. Both are therefore given in substance in the general article on GREEK EDUCATION.

Higher education in Plato's scheme was almost exclusively mathematical, though we know that he encouraged grown men, like his nephew, Speusippus, and Aristotle, to study other branches of science, such as geology, botany, and zoölogy. That, however, belongs to the history of scientific research rather than to that of education, and it is clear that Plato insisted upon a preliminary training in mathematics for all his students. The whole scheme is really the development of a single thought, which he owed in great measure to the Pythagoreans. The earlier education was directed to the inculcation through time and tune of an instinct for order and harmony. An ordered and harmonious soul is the first requirement of a good citizen; but, besides that, the Greeks felt that the intervals of the octave had their counterpart on a larger scale in the ordering of the heavenly bodies, and that the great universe itself was tuned like a lyre. The aim of education is, therefore, to put the soul in tune with the world and with God. That is why it is mathematical throughout.

It is becoming more and more clear that Plato's *Laws* had a very great influence in the age which immediately succeeded him. Already in his own lifetime the Academy was recognized as a school of politics, and especially of constitutional law. Many cities applied to it for legislators, and in this way the theories of *The Laws* came to be realized in the codes of actual states. This seems to have been the case with the educational principles contained in the work also. It is generally recognized that, by founding the Academy, Plato became the real author of the university system; it is not always noticed that he was also the inventor of the school as we understand it. At Athens in the classical period there were no schools at all, if we mean by a school a public institution with a regular curriculum. Parents sent their sons to one teacher to learn reading and writing, to another to learn music, and so forth; but all these teachers were private tutors, as it were, and quite independent of one another.

In recent times, much attention has been paid to Plato's theory of education, but this has been almost entirely confined to the discussion of the subject in *The Republic*. As has been said, the guiding principles are to be found there, and they are rather assumed than established in *The Laws*. It is from *The Republic* that we learn his view that education is above all a sort of conversion, a turning of the eye of the soul to the light. It is also from *The Republic* that we learn the psychological basis of the system. It is not correct to say, as people usually say, that music is the education of the soul and gymnastics that of the body. Rather these are the education of two different " parts " or elements in the soul, and the excess of either produces an ill-balanced and inharmonious character.

It is also from *The Republic* that we get a fuller knowledge of the higher education in its four main branches of arithmetic, geometry, astronomy, and music, which long survived in the medieval *quadrivium*. But, on the whole, what we chiefly owe to Plato is the idea of an organized school with a definite curriculum, and that is derived from *The Laws*.

Platonic Philosophy of Education. — Plato's treatment of education is a closely interwoven fabric of interpretation of the social and moral conditions of his own day, with principles and problems having a perennial import. His most important contributions to a permanent philosophy of education may be enumerated as follows: —

1. The problem of education is an inherent portion of the philosophic question, and conversely education is treated as the social and moral art through which the theoretical results of philosophy shall be made effective in life. (See PHILOSOPHY OF EDUCATION.) It is no accident that his two chief treatises on the right organization of social life (*The Republic* and *The Laws*) are also chief authorities for his ethics, metaphysics, and educational theory. He retains and continues the Socratic notions that right conduct presupposes true knowledge, and that the theory of true knowledge (logic or dialectic) is of practical or moral importance since it is a necessary instrument in bringing men to a consciousness of ignorance and opinion, with their attending evils, and in providing them with the means of attaining the knowledge that leads to the good. The genuine practice of dialectic as distinct from the spurious (eristic and sophistic) is thus an integral part of right living. Philosophy is thus no merely theoretical exercise, but defines the method of education, that is, of the conversion of the soul to the good and of the latter's progressive realization. Plato, in avoiding the sharp antithesis of knowledge and practice, also avoids the error, so common in subsequent thought, of making educational theory a mere external annex of philosophy.

2. Plato adds a distinctly new factor to the Socratic conception, in his conviction that knowledge is relative to social organization. That is to say, ignorance and mere opinion are inevitable in the degree in which self-seeking and division infect society, whether these are expressed in despotisms or in anarchic democracies. Such societies involve exclusive " particularity " of knowledge as the counterpart of the division of classes and interests.

Instead of affording the universality and permanence which are the patterns upon which true knowledge is modeled, they generate ignorance and casual opinions masquerading as truth. This strict correlation between right knowledge and right social organization involves, as its consequence, the equally strict correlation of educational theory and the theory of politics or sociology — the theory of the organization of the state. So far as the records indicate, Socrates had thought the conversion of the soul to true knowledge might be brought about by personal discipline independently of the action of the social environment.

This interdependence of true knowledge and the right organization of the state is Plato's answer, in anticipation, to the charge brought by Aristotle, and often repeated, that Plato overestimated the importance for right action of a purely theoretical knowledge, and ignored the need of habituation and practice. According to Plato, the attaining of the true theoretical knowledge itself implies and requires a long period of education in a social medium where the individual, acting in accord with principles of unity, balance, and harmony, absorbs into his practical habits the factors which make possible later on an independent theoretical vision. The Platonic social hierarchy, with philosophers at the top as social rulers, follows from his insistence upon social practice as an indispensable prerequisite for genuine knowledge. That Plato is caught in a circle, on the one hand insisting upon true, or philosophic, knowledge as a condition of right social organization and, at other times upon right social organization as an antecedent of philosophic insight, must be freely admitted. Since he had no conception of evolutionary growth, or gradual progress, he could not conceive that the true state should be ushered in otherwise than by a happy conjunction of circumstances; when once hit upon, it must be kept, at all hazards, intact against any further change, even in its minor details.

3. Plato clearly perceives, what later intellectual specialization obscured, that the motive and principle of the organization of the sciences is educational. The various sciences may be literally said, in accord with the Platonic spirit, to be *studies;* their differentiation and coördination is an affair of specifying the subject matter of an adequate education and of designating the proper aim of each branch of knowledge in the educational whole. A purified music and gymnastic (the customary content of Greek education) pave the way for the new studies of nature (astronomy and physics in the form of cosmology); these pass insensibly into mathematics; mathematics into dialectic; dialectic culminates in the apprehension of the final ends, centering in the conception of the Good, whence a reverse, or deductive, movement leads back to the study of politics and ethics. There is, of course, much in the specific content of this account that subsequent philosophy and science have rendered untenable. But the underlying idea that the distribution and correlation of the various sciences is ultimately an educational matter, not an abstract intellectual one, must be regarded as a permanent contribution.

4. Plato states and treats the problem of the place and relations of the individual in society as an educational problem. Society is a complex unity; it involves the active coöperation of a number of diverse functions. Individuals are born with distinctive capacities. From one standpoint the need is that these various individuals' capacities be distinctively harmonized with a coördinated, unified social unity. From another standpoint, the need is that every individual be trained to intensity and efficiency of action in the particular capacity which distinguishes him by nature. The unity and order of the state suffer when individuals, instead of sticking to the single function for which they are naturally equipped, assume a multitude of activities, thereby encroaching on the sphere of others and introducing conflict into the social whole. Education supplies the means of satisfying the need from whichever side it be regarded. The business of education is to determine the social office for which individuals are fitted by a continuous process of selecting, sifting, and testing, in which the special talents and limitations of each individual are revealed. Practically, there is some truth in the complaint that Plato sacrificed individuality to the supposed requirements of social unity and stability. In theory, however, he held that the discovery of the special capacities of an individual so as to hold him to an occupation that should utilize his powers in the interests of the social whole was the sole method of securing both the true happiness of the individual and the good of the state. The education that discovers and trains the peculiar powers of an individual is at the same time the method by which intrinsic, instead of coerced, harmony is achieved in the state. This conception appears to present a permanent factor in the problem and ideal of education. The limitations in the Platonic treatment are due to the fact that he held the individual variation down to certain fixed limits and types, which corresponded to certain fixed classes in the state. Having the idea of a small number of classes within which variations in individuals fall, he was also led to the notion that the corresponding social classes have to be arranged in an order of inferiority and superiority. Advance since the time of Plato is in the direction of recognizing that individual variations are of the very heart of individuality itself, and that accordingly the development of characteristically individual powers is destructive of the existence of fixed social classes. Variety of social

activities conspiring to a coöperative unity of result has thus been substituted for hierarchical subordination of classes as defining the aim of education.

5. The characteristic rôle, already alluded to, of the æsthetic and the artistic in education represents another permanent contribution. The æsthetic and artistic provide the connecting link and the solvent factor with respect to the relation of the practical and the theoretical in education — an idea which is at the basis of Schiller's conception of education. On the one hand there is the need of practice, of repeated exercise, of habituation in education. This, by itself, tends to routine, and thus to a limitation of rational insight. But not so; if it is based upon spontaneous, uncoerced tendencies — upon play instincts. In this case, education, even as habituation, or practice, involves the emotional attitudes of the individual and an æsthetic subject matter which, through its inherent content of proportion, harmony, balance, and nobility, effects an insensible transition to rational insight. The treatment of gymnastic as well as of music is directed by this principle; Plato's well known attack upon poetry and dramatic art is based not upon a depreciation of the educational function of art and æsthetic appreciation, but upon his belief in their supreme educational significance and the consequent need of their supervision and control in the interests of the state. J. D.

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PLATTER, THOMAS (1499–1582). — Swiss scholar, printer, and teacher, chiefly known through his autobiography, which is written in a very quaint and interesting style and forms a valuable document for the history of education in the sixteenth century. He was born at Grenchen, in the canton of Valais, and spent his early youth as a goatherd. Then he was taken out into the world by a cousin and, as traveling scholars, they roamed for years through Saxony, Silesia, and Bavaria. The description of their roving life and their adventures affords a remarkable picture of the times. Platter finally found a home in Zürich, in the house of the schoolmaster Myconius. There he studied Latin, Greek, and Hebrew, but at the same time learned the trade of a ropemaker. In Zürich he also embraced the doctrines of the Reformation, which had been introduced by Zwingli. From there he went to Basel, where he worked at ropemaking and, in his spare time, delivered lectures on Hebrew grammar at the university. Later he established a printing press at Basel. In 1541 he was put in charge of the Basel school, where he taught for nearly forty years, until he was retired in 1578.

See Bacchants.

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PLAY. — A name given to those activities which are not consciously performed for the sake of any result beyond themselves; activities which are enjoyable in their own execution without reference to ulterior purpose. For a long time the theory of play most generally held was that most thoroughly elaborated by Herbert Spencer; namely, that play represents the overflow of superfluous energy, the base line from which to measure excess being the amount of energy required to maintain the level of health and perform imposed tasks. Since children are relieved of most of the duties connected with getting a living, they naturally have a relatively larger amount of excess energy at disposal. Since the channels of the discharge of the superfluous energies are those of necessary and useful works, it is not surprising that plays largely simulate practical activities. The more prolonged study of the plays of animals and savages impressed Groos with the extent to which plays represent acts that are useful in later life. He formulated the idea that the chief thing about play is that it gives preparatory exercise in later necessary functions. This is usually regarded as a rival theory to that of "surplus energy," but it is evident that the theories are framed from different standpoints and have no point where they touch each other. One theory might be correct as an account of the causal conditions of play, and the other as an account of its value.

As a matter of fact, however, the theory of surplus energy seems to be influenced by a survival of the once general conception that individuals are naturally averse to any kind of activity; that complete quiescence is the natural stage of organic beings; and that some fear of pain or hope of pleasure is required in order to stir individuals to effort which in itself is painful. The fact of the case is that from intra-organic stimuli, the organism is in a constant state of action, activity indeed being the very essence of life. When the myth of natural quiescence is surrendered with its accompanying myth of the need of a special premium in order to arouse an inert agent, it ceases to be necessary to search for any special cause or any special object order to account for play. The only thing necessary is to state the conditions under which organic activity takes this or that form. So considered, we find various forms, which are of sufficient importance, educationally at least, to justify differentiation; namely, play, amusement, art, work, labor, drudgery.

In any case the starting point is the active processes in which life manifests itself. As stimuli direct this activity one way or another, some of its modes are peculiarly rewarding. The stimulus not only arouses a certain kind of activity, but the responsive activity returns upon the stimulus so as to maintain it and to vary it. These variations supply the stimuli for keeping up more action. The moving spool draws the organic response of the kitten to itself; this response continues to give the spool the kind of movements which continue to excite organic reactions. There is no difference in kind between the spool as a stimulus and a mouse, save that the latter has peculiar stimuli of the sense of smell and, when crunched by the teeth, of taste, that call out special responses. In like fashion, a baby plays with certain stimuli so as to keep up, with certain variations, a certain mode of action. Seeing a thing in a certain way evokes responses that make further seeings enjoyable.

After such processes have been frequently repeated, they are complicated by the fact that an idea of the result of prior activities is superadded. It may be that the idea of this result as a possible outcome will be a sufficient stimulus to keep the activity going after it has ceased to afford adequate stimuli so far as its direct results are concerned. If the idea of the result operates as a stimulus to renew the otherwise flagging activity, and if, in addition, the accomplishing of the result involves a certain selection and arrangement of acts antecedent to it, we get a type of activity sufficiently contrasted to be termed work. But as action involving the idea of an end grows naturally out of a spontaneous activity, so "work" in this psychological sense is inevitably preceded by play and grows insensibly out of it. The chief point of difference is not the agreeableness of one and the disagreeableness of the other, but that in the case of work the idea of an end enforces reflection on the relation of means to end, and stimulates a corresponding readjustment of activities originally spontaneous. Not only is the satisfactoriness of the activity not the main differentia, but, with increasing complexity of powers, prior activities are too simple to afford the necessary stimulation (and hence the desired satisfaction) unless they are expanded by a less immediate and more indirect adjustment of means to ends. At one stage of development, the relation between end and means is so close that if the dominating idea is that of playing "set the table," anything will be turned to account for a table and for dishes. With maturity of perception, the activity is not sufficiently complex to be enjoyed unless things can be devised and employed that are objectively adapted to the end. Action requires a greater amount of intellectual control and of practical check in order to be satisfactory, or worth while. At this point, and not at that of utility *versus* freedom, or of that which is an end for itself *versus* that which is a mere means for something else, lie the differentia between play and work.

Further distinctions are due to social conditions. The stimuli to activity become more social as intelligence develops. The interests and occupations of adults are the points of departure and the directing clews of children's actions. (See IMITATION; and INFANCY.) Certain plays have outcomes and methods that are determined by social conventions; such plays, carried on by rules, are games. But the distinctions of amusement, labor, and drudgery also arise from social conditions.

Labor is a fact of economic origin. Wherever industry is subdivided, as it is beyond the fishing and hunting stage of civilization in greater or less measure, the product of work is not a direct stimulus to the prior process, for this product is not itself enjoyed or consumed, but is exchanged for another object (or for money). This means that the direct end of action is not its adequate stimulus; that something not directly cared for is done for the sake of a more ulterior end. This implies the possibility at least of the direct activity being itself so disagreeable that there is an aversion to it, which is overcome only because of the need for the ultimate object. Under certain conditions of economic life, labor almost inevitably takes on this externally enforced quality, and, as it is intrinsically irksome, becomes drudgery. The notion, referred to earlier in this article, that man is naturally averse to action and hence is moved to it only by fear of evil or love of reward, was taken into psychology from economic theory at a time when industrial life consisted mainly in wage-earning under conditions themselves repulsive. Amusement is differentiated from play by a sort of contrast effect. Children do not normally play for the sake of amusement, any more than for the sake of any end beyond the action itself. They live in their actions, and these actions are called play because of certain qualities they exhibit. But adults (as well as children whose surroundings are socially abnormal) need relief from labor, especially from drudgery. Powers not used at all, or used under enforced and distorted conditions during working hours, need stimulation. The things outside the ordinary routine activity of labor that yield this stimulation constitute amusements. The fact that they are called recreations and are employed for purposes of relief indicates a contrast-effect not normally present in the play of childhood.

It is also desirable to distinguish an attitude of mind as playful. Matthew Arnold, for example, called ability to occupy the imagination fruitfully with a subject, the ability to allow the mind to play freely about the subject, a sign of culture. This attitude of mind is distinguished from inability to enjoy intellectual activity upon a subject except in the interest of some preconceived theory or some practical utility. This capacity to draw satisfaction from the immediate intellectual development of a topic, irrespective of any ulterior motive, represents a genuine outgrowth of the play attitude — a special form which it may take. Unless play takes this intellectual form, the full spirit of scientific inquiry is never realized; much, if not all, of what is termed the love of truth for truth's sake in scientific inquiry represents the attitude of play carried over into enjoyment of the activities of inquiry for its own sake. The putting forth of observation, reflection, testing, is enjoyed on its own account, irrespective of ulterior by-products, just as in early childhood certain strenuous and even hazardous forms of physical effort may be intrinsically satisfactory.

Play and Education. — The account that has been given indicates, in outline, the chief educational problems connected with the topic of play. The original discovery of its importance in education, by Plato, and its rediscovery by Froebel, may be said to constitute the basic principles of the method of instruction. The foundation of all later growth is the activity of the earlier period, which, so far as the consciousness of the individual is concerned, is spontaneous or playful. Hence the necessity that the earlier plays be of such a sort as to grow naturally and helpfully into the later more reflective and productive modes of behavior. This means that play should pass insensibly into work (though not necessarily into labor), and that earlier play and work alike be of the kinds which afford exercise in the occupations that are socially useful. For a genuine initiation into them through play means not only that the individual has acquired, under conditions of least resistance and greatest economy, the skill required for efficiency judged from the social standpoint, but that he has done so through the engaging of his own imagination and emotions. In other words, the natural transition of play into work is the means and the only means of reconciling the development of social efficiency with that of individual fullness of life.

Other educational problems arise from the economic conditions under which industry is carried on at present, with its extreme specialization of labor and its control by reference to a medium of exchange instead of by commodities valued on their own account. It is a part of the business of education to fortify and enrich the imagination so that the mechanical phases of industry shall not leave an unformed mind at the mercy of sense, appetite, and trivial fancy. It is a part of its business to come into sufficiently close contact with the conditions of industry so that those who go from school into industry shall be trained to understand the whole of which their work is a small fraction, and thus to see a meaning in their work which they could not otherwise perceive. Moreover, it is necessary that the plays and games of the school should be so directed as to instil a love for and capacity in wholesome forms of recreation and amusement. Perhaps there is no more neglected aspect of social education at the present time than just here. Because amusement is contrasted with serious things we have forgotten that the function of recreation, of the spending of the hours of leisure, is one of the most serious questions, intellectually and morally, of life, and that any educational system is defective which does not make systematic provision for this as well as for the hours of work. J. D.

See Activity; Arts in Education; Course of Study, Theory of; Froebel; Games; Instincts; Kindergarten.

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PLAY CENTERS. — See Playgrounds.

PLAY, FREE. — In the kindergarten the use of materials to stimulate free response on the part of the child, *i.e.* to insure self-activity, is an activity of free play. The term is opposed to directed play, where there is selection from the responses of free play for the purpose of increasing the educative value of the activity.

See Kindergarten; Play.

PLAY, HYGIENE OF. — See Play; Playgrounds.

PLAYFAIR, LYON (1808–1898). — English scientist and politician, responsible in large measure for the introduction and spread of technical education in England. He studied at St. Andrews University, the Andersonian Institute at Glasgow, the University of Edinburgh, and at Giessen under Liebig, whose book on applied chemistry he presented at the British Association meeting in 1840. Always interested primarily in applied chemistry, he was appointed by Peel on a commission to inquire into the sanitary conditions in large towns. He played an important part in organizing the Exhibition of 1851 and came into close touch with the Prince Consort, who was interested at the time in promoting technical and scientific education in England. Playfair about this time visited the Continent to study the organization of technical instruction, and on his return lectured on the subject in England. He was largely responsible for the foundation of the Science and Art Department, of which he became one of the secretaries (1853). He also took a large share in establishing the Royal College of Science, the South Kensington Museum, and the 1851 scholarships for science. In 1858 he was appointed professor of chemistry at Edinburgh. In 1868 he entered Parliament as representative of the Universities of St. Andrews and Edinburgh, and 1885 as member for South Leeds. He held office several times, and in 1892 was raised to the peerage. Playfair used his influence in Parliament in favor of education and social improvement. Among the many commissions and committees of inquiry on which he served may be mentioned those on the Scottish universities, on endowed schools, and on civil service reforms (Playfair Commission, 1876).

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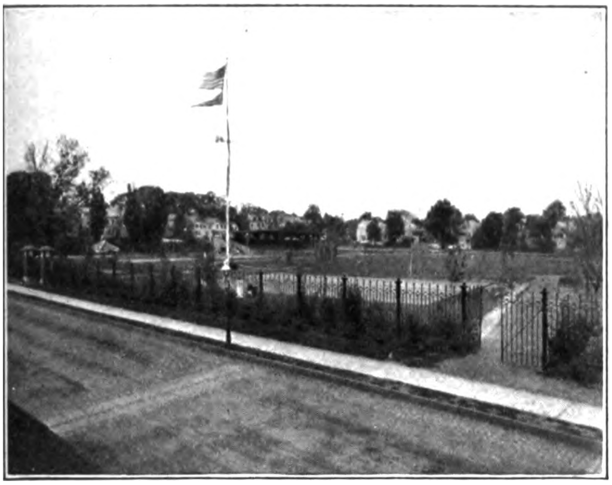
PLAYGROUNDS. — Plots of ground set aside for the holding of games, sports, athletic exercises, and amusing activities of various sorts. In the United States the deliberate provision of these areas was begun in 1886 when " three piles of yellow sand were placed in the yards of the Children's Mission," in Boston. The next year this society established eleven sand piles — one being in a school yard, — and special matrons to look after the children enjoying them were employed for the first time. With the growth in the number of the playgrounds they also became larger, new games appeared, and teachers trained in kindergarten methods were put in charge of them. In 1893 two summer playgrounds were started by philanthropic people in Philadelphia. The Children's Kindergarten Association started sand gardens in Providence, R. I., in 1894. About the same time several private playgrounds were started in New York City, but the movement did not really get under way until 1898, when the board of education, on taking over the vacation schools of the Association for Improving the Condition of the Poor, established twenty school playgrounds or sand gardens. The first summer playground in Chicago was started in 1897 through the efforts of the Associated Charities. Since that time the spread of the playground movement has been rapid. During 1911, according to reports received by the Playground and Recreation Association of America (75 cities known to have playgrounds did not report), playgrounds were maintained in 257 cities of the United States, the total number of such grounds being 1543. On their staffs, not including the caretakers, were 4132 men and women. The total expenditure for maintenance amounted to $2,736,506.16. In 36 of these cities the playgrounds were kept open throughout the year. Public parks, school yards, and vacant lots are the usual sites, but some of the larger cities conduct playground activities on specially constructed piers along the water front, and in the basements and on the roofs of schools and other large buildings.

Equipment. — The facilities provided vary greatly in character and quantity in accordance with local conditions. In Chicago, where the playgrounds form integral parts of an extensive park system, the typical layout includes a field large enough for baseball or football; a field house having a refectory, reading, club, and assembly rooms; indoor and outdoor gymnasiums for each sex; a large swimming pool for adults and a wading pool for small children. The latter forms the center of the children's space, which is equipped with sand courts, swings, teeter boards, slides, giant strides, and similar apparatus. The main field can be flooded in the winter for skating, and electric lights make it possible to use the large swimming pool by night as well as day from spring until fall. While such ample facilities are rather unusual, they indicate the kinds of equipment which in varying degrees of completeness are found in the park playgrounds throughout the country.

A typical school-yard equipment consists of several swings and teeters, a sand pit, a frame swing, basket-ball standards, a tether ball equipment, a net for volley ball, a standard for high jumping, a springboard, and a supply of playground balls, also materials for sewing, basket making, and raffia work. In many yards only jumping standards, horizontal bars, and sand piles are to be found, and in general more dependence is placed upon organization than equipment when the playground is managed by school officials.

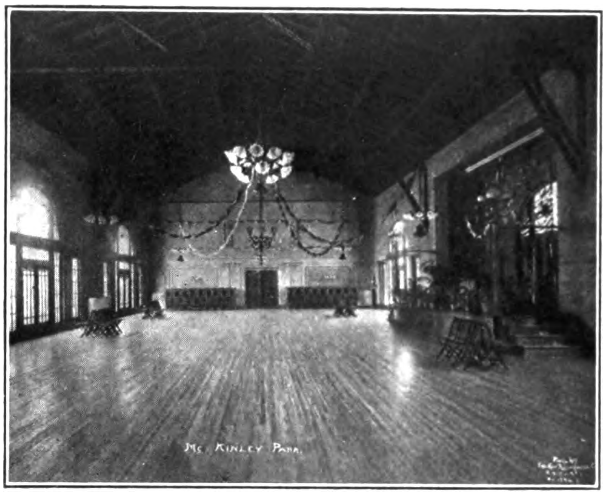
The principal playground activities have been sufficiently indicated by the description of the equipment. Among those which are



A Public Playground, East Orange, N.J.

A School Playground, Detroit, Mich.

A Public Playground, Haarlem, Holland.



Assembly Hall in the Field House of a Public Playground, Chicago, Ill.

A Park Playground, Chicago, Ill.

Roof Playground, Public School Building, New York City.

PUBLIC PLAYGROUNDS

also found may be mentioned various kinds of hand work, gardening, story-telling, singing, folk dancing, amateur theatricals, pageants, and club work frequently of the self-governing type. Sometimes the playground is the headquarters of boy scout patrols and camping parties. The nature of the work carried on by the New York Board of Education is shown in the following program:—

New York Daily Program

1.00–1.30	Assembly	Marching Singing Salute to the Flag Talk by the Principal
1.30–2.30	Organized Games	Kindergarten Gymnastic
2.30–3.00	Organized Free Play	
3.00–4.00	Drills	Gymnastic Military
	Folk Dancing	
	Apparatus Work	
	Occupation Work	Raffia Clay Modeling Scrap Books
4.00–4.45	Organized Games	Kindergarten Gymnastic
4.45–5.15	Basket Ball Athletics Good Citizens' Club	
5.15–5.30	Dismissal	Marching Singing

Roof Playgrounds.—The utilization of the roof as a playground is made possible by paving the surface and erecting light steel trusses over which is spread a coarse wire netting. The schoolhouse roofs in New York City which are used by the boys in this way are equipped with basket-ball hoops and marked off for tennis and indoor baseball. Those for the girls usually have no apparatus, as the principal activity is that of folk dancing. Music is provided by a band of four or five pieces, and sometimes (during the hot summer evenings), as many as 2000 girls assemble on one roof. In the afternoons some of these spaces are enjoyed by the smaller children, who are frequently accompanied by their mothers, and swings, seesaws, sand boxes, and slides are provided. Through the furnishing of seats, flower boxes, hammocks, and pavilions the roofs of some of the more modern tenements, apartment houses, hotels, and other institutions in the large cities are being converted into roof gardens and outdoor play spaces.

The recreation piers, which have been established in several large cities, have the form of huge pavilions, and the activities carried on in them are mainly folk dances, marches, and ring games. Certain of the piers are equipped with hammocks and folding cots for babies and play outfits for very small children, and these, under the management of trained nurses, are effective in reducing infant mortality during the hot season.

Administration. — The duration of the playground season varies greatly, but in general it coincides with the warm months. In park systems where there are field houses, it frequently lasts throughout the year, and in a few cities the privileges are open on Sundays as well as week days. School playgrounds are usually open from 1.30 to 5.30 P.M. during six or eight weeks of the summer, but there is also a tendency to make their facilities available after class hours during the regular school term. The staff at some of the larger park playgrounds numbers from fourteen to twenty specially trained play leaders and gymnasium instructors, but in general the number is from four to six. In systems under municipal control the employes are usually selected by civil service methods. The instructors in the Chicago park gymnasiums receive $1100 a year, while in New York the principals of the school playgrounds receive $4 a session, and the assistants' rates vary from $1.75 to $2.50 per afternoon. Throughout the country the usual rate of pay for a qualified play leader is about $2 a day. The technique of the work has become so highly elaborated that a special training is now indispensable, and many colleges and normal schools are giving courses in the theory and practice of play and in playground administration.

The administration of about one half of the American playgrounds is still in the hands of the voluntary agencies, principally known as playground associations, through whose initiative they were started. In over one fourth of the cities they are managed by the park department, in one sixth by the school board, while in the remainder they are under the control of municipal playground or recreation commissions. The novel and special character of the problems involved, with the diversity of the recreational resources in the average community, makes it desirable that the administration be in the hands of persons with an enthusiasm and proficiency for its tasks. If they form an independent body they can secure coördination in the management and economy in the use of the various facilities for play possessed by the park, school, dock, and other departments of the municipal government. The prime motive back of the playground movement was to increase the amount of *space* for play, and accordingly the activity has been greatest in districts congested by population. The reënforcement of this motive by the obvious moral and educational values of directed play has made it relevant to all kinds of population conditions, and the movement is now extending not only to the small cities, but also to the towns and villages and even to the rural districts.

Results. — Among the more conspicuous effects which have been traced to playground work are a reduction of juvenile delinquency, a lessening of street accidents to children, an improvement in the racial relations in communities largely populated by foreigners, and a quickening of mental power among school pupils. The popular demand for playgrounds is tending to increase the size of school yards and the provision of bathing and gymnasium facilities in the school buildings.

European Playgrounds. — Abroad the emphasis has been placed upon the organization of play rather than upon the extension of places for it. The efforts are made almost entirely by voluntary agencies, though these, especially on the Continent, frequently receive considerable financial support from municipalities. In England the education authorities of a score or more of cities grant the use of school grounds, buildings, and public parks to such organizations as boys' and girls' brigades, scouts, Children's Play Centers committees, and Children's Happy Evenings societies. In a few cases the authorities are also giving financial aid, but usually the provision of apparatus and organizing ability comes from the voluntary organizations. On the Continent the most active agents are the Central Committee for the Encouragement of Games in Germany, the Society for the Promotion of Games of Vienna, the German Society for the Promotion of Organized Play at Prague, the *Comité des écoles de garde* of Paris, the Society for Open-air Games of Gothenburg, Sweden, and the Swiss Society for Games and Excursions. C. A. P.

See GAMES; PLAY.

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PLAYS, SCHOOL. — See DRAMA AND EDUCATION; FESTIVALS, SCHOOL.

PLEASURE. — See PAIN AND PLEASURE.

PLENUM SYSTEM. — See VENTILATION.

PLOTINUS. — See NEOPLATONISM.

PLURALISM. — The opposite of monism (*q.v.*); the theory according to which there are a number of independent ultimate principles of reality or real beings. It includes systems as diverse as the atomism of Democritus, the monadism of Leibnitz and Herbart, and the radical empiricism of William James (*qq.v.*). J. D.

PLUTARCH (*c.* 46–125 A.D.). — One of the greatest teachers, historians, and moral philosophers of antiquity, who was educated at Athens and traveled extensively. He spent some time at Rome, where he lectured on ethics, acted as tutor of the youthful Hadrian, and collected historical materials. Returning to Greece, he organized a school at Chæronea, his birthplace, where for many years he lectured to the young and composed dialogues after the manner of Plato and Cicero. Here he carried on his historical studies and wrote his *Parallel Lives.* These embodied the results of enormous erudition and research. Their purpose was chiefly ethical, and they exerted a powerful influence in upholding the highest Greek and Roman ideals of conduct. They formed the basis of Roman education in both home and school for many generations and furnished Shakespeare, Milton, Browning, and other modern writers with materials for some of their greatest works. His *Opera Moralia* consists of sixty didactic essays, the first of which, *On the Education of Children,* is an educational classic. It is the oldest extant treatise entirely devoted to education. Plutarch insists upon the importance of heredity and a good example from parents; argues that the schoolmaster must be of blameless life, pure character, and great experience; subordinates all advantages of rank and fortune to education, of which philosophy should be the chief study, but not to the neglect of science; approves of the higher education of women in order that they may help in the education of their children; and recommends that paternal discipline should be long and thorough. W. R.

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POETRY. — See LITERATURE.

POGGIO BRACCIOLINI, GIOVANNI FRANCESCO. — See RENAISSANCE AND EDUCATION.

POISONS AND POISONING. — See INTOXICATION; INJURED, FIRST AID TO.

POITIERS, UNIVERSITY OF, FRANCE. — Founded in 1431 by Charles VII to draw students away from the University of Paris, then in the hands of the English. The University constitution was modeled on that of Toulouse (*q.v.*), a compromise between those of Paris and Bologna. There were originally faculties of law, theology, medicine, and arts. The first mention of statutes appears in 1488, but they were revised in 1553, and remained in force until the Revolution. The University was at no time of great eminence, and it was already in a condition of decadence when it was closed at the time of the Revolution. The law faculty was restored in 1806, followed in 1846 by the faculty of letters, and in 1856 by the faculty of science. In 1841 the *École de Médecine*, now the *École Préparatorie de Médecine et Pharmacie*, was established. The enrollment at the University in 1911 was 1135 students, of whom 875 were in law.

See FRANCE, EDUCATION IN.

POLAND, EDUCATION IN. — **History.** — The division of the territory of Poland between Russia, Prussia, and Austria, which was accomplished in 1795, ended the independent existence of one of the oldest and, for a time, one of the most powerful kingdoms of Europe. Its history begins to take definite form in the latter part of the tenth century, when Christianity was forced upon the people by King Mieczyslaus I. For centuries following this kingdom served as the bulwark of Europe against Mongolian, Tartar, and Turkish hordes, and eventually as the " Champion of Christendom " against the Moslem power. The early history of education in Poland is a record of clerical and cathedral schools, of monastic schools maintained by the order of the Benedictines, who were invited to establish themselves in the country, in the eleventh century, by King Boleslaus the Great, and of the rise of town schools in the thirteenth and fourteenth centuries, — the result of German migrations into the centers of trade and industry. As in the other European nations the studies of the principal schools were those of the trivium and quadrivium, and the language of instruction was Latin; but the Polish language appears to have been used conjointly with the Latin, and the German language in the schools established by German settlers.

Both the weakness and the strength of Poland and the character of its national education were due to its political structure, which was that of a feudal aristocracy or aristocratic republic. The nobles from the beginning had absolute power over their serfs, and their restraint upon the authority of the king steadily increased until he became merely their agent. Education was the privilege of the nobles and reflected their spirit. Toward the close of the twelfth century, the sons of the nobility began to frequent the universities of Italy and France. In the thirteenth century they were sufficiently numerous at the University of Paris to form a "nation." Thus intellectual attainments were added to the military prowess for which the nobles were distinguished. The fourteenth century was marked by the extension of the power and the territory of Poland. Wealth increased through the commercial activity of the great towns, two of which, Dantzic in the north and Cracow in the south, at this time the capital, joined the Hanseatic League; Warsaw and other towns on the Vistula sprang into importance. The political constitution of the nation, as an aristocratic republic, was defined by statutes passed during the reign of Casimir III (the Great). The supremacy of the nobles was confirmed by these acts, but their power of life and death over the peasantry was abolished, and a degree of civil independence was assured the towns. The national Diet also assumed form at this time, the nobility and higher clergy having chief representation therein, although merchants and the inferior clergy were admitted; the principle of hereditary succession to the crown was ultimately eliminated, and the sovereign was elected by the Diet.

Education naturally engaged the attention of a lawgiver like Casimir the Great, and in 1364 he laid the foundations of the first university in Poland, at Cracow, having the purpose of creating a great school after the model of Bologna. The statute authorizing the institution was published on Pentecost of that year, but its actual operations were deferred for over twenty-five years. Casimir the Great died in 1370 and, having no direct heir, he was succeeded by his nephew, Louis of Hungary. This event increased the foreign relations of Poland and introduced new ecclesiastic and scholastic influences. After the death of Louis, in 1382, his second daughter, Jadwiga, was elected sovereign, but upon the condition that she should take, for her husband, a prince chosen by the diet. As a consequence of this agreement she was married, in 1386, to Jagielto, prince of Lithuania, thus effecting the union of this principality with Poland. The new territory stretched from the Baltic to the Black Sea and eastward to Moscow. Its religion, that of the Greek Church, and its official language, White Russian, were brought by the union into immediate contact with the Roman Church and the scholastic Latin. In 1402 the University of Cracow (*q.v.*) was inaugurated with great ceremony and under strong ecclesiastical influences, Paris, instead of Bologna, being the model. Queen Jadwiga, who died in 1399, had left her fortune for the university; and it was richly endowed by the king and the bishop of Cracow. With the introduction of printing, the city became the center of literary activity, in the midst of which the university enjoyed great distinction by reason both of its valuable library and of its learned members. In the sixteenth century it gave to Poland the historian Jan Dlugosz, the mathematician Albert of Brudzen, and his immortal disciple, Copernicus.

The dynasty of the Jagieltos continued with a brief interruption nearly to the seventeenth century, when the throne became entirely elective. Under the successive rulers of this house there were repeated conflicts with the Germans, the Turks, and the Russians, and those hatreds were engendered which eventually proved disastrous to Poland's national life. During the same period the power of the nobles was constantly augmented through their control of the Diets. The elements of discord within the kingdom were increased by the spread of the Lutheran doctrines, which were accepted by the order of the Teutonic knights, and rapidly transformed the German schools. Rival schools increased their activity, and under Sigismund II, who reigned from 1548 to 1572, religious animosity gave rise to fierce persecutions.

The University of Cracow yielded nothing to the new religious doctrines and was unmoved by the spirit of the Renaissance, which was transforming the universities of Western Europe; consequently the Protestants established higher schools of their own. Two of these, created in the sixteenth century by the Calvinists of Lithuania, at Kieydany and Slutsk, respectively, are still in existence. The Bohemian brothers established a higher school at Lissa, which numbered among its directors John Amos Comenius. It was probably to offset this movement that the Bishop of Varmie, in 1564, invited the Jesuits to open colleges in his diocese. From this time to the middle of the eighteenth century the influence of the Jesuits was supreme in educational matters, but eventually they gave place to the Piarists (*q.v.*), who entered into the field in 1596. The schools of other religious sects, the Lutherans, Greek Church, etc., merely reached their own adherents. Thus through the divergence of ideals the educational provision of the country tended to destroy the sense of national unity. The situation is illustrated by the following summary of schools and higher institutions for 1740: —

Catholic Universities	
(Cracow, Zamosc, Vilna)	3
Secondary Schools	
Preparatory to Cracow and Zamosc	10
Preparatory to the Jesuit University, Vilna	67
Controlled by Piarists	27
Controlled by Protestants	5
Total	112

In the higher and secondary institutions there were 22,400 students and in the 1500 elementary schools above 30,000 pupils.

The great body of the people at this time were in a state of ignorant servitude; only the nobles, the merchants, and a very small proportion of the free peasantry were instructed; the nobles constituted the nation, but a nation broken by religious dissensions and feuds, and menaced by hostile forces on every side. In this crisis the reform of education was undertaken by Stanislas Konarski, a Piarist priest who had been a student in the famous Nazarene college at Rome. After completing his studies he made a tour of France and came into intimate relation with Charles Röllin, who had completely reformed the higher schools of his own country. Encouraged by this example, the Abbé Konarski, on his return to Poland, established a school of a new order for the young nobles, the *Collegium Nobilium*. Its curriculum comprised the exact sciences, physics, astronomy, mathematics, geography, universal history, the history of Poland, and the classics in restricted degree. The influence of the college was supplemented by that of the "school of cadets," which was established by Stanislas-Augustus Poniatowski, soon after his election to the throne in 1764. Although this king appears to have been a mere puppet in the hands of the Empress Catherine of Russia, the military school became a nursery of nationalism. Among its cadets was Kosciusko, chief of the band of patriots who sought to free their country from foreign invaders. The educational reform was opposed by the Jesuits; but the disastrous contests of 1772, in which Prussia and Austria wrested entire provinces from Poland, gave irresistible force to the national movement. It was fostered by Rome as the only check to the encroachments of Russia and the Greek Church, and by Papal Bull of July 21, 1773, the order of the Jesuits was suppressed, and their confiscated properties were turned to the service of the reform movement. A few months after this event, the Diet created a Commission of Public Education and to it committed the charge of all the schools, colleges, and universities in the country. The secretary of the Commission was Gregory Pyramowicz, a Jesuit, but in full sympathy with the reform movement. The measures advocated by this commission anticipated many of the more important provisions of modern systems. The universities were transformed, normal schools established, and laws were enacted (1783–1790) regulating the entire service of public instruction. In the colleges the Polish language replaced Latin as the medium of instruction; the sciences and civil and ethical subjects took the place of the scholastic philosophy and metaphysics, and observation and experiment broke up the old routine of memoriter recitations. A special committee was appointed to secure a new order of textbooks, and provision was made for the systematic inspection of elementary schools and for supplying them with trained teachers.

Thus, on the eve of its destruction as a nation, Poland bore an important part in the educational reforms of the eighteenth century, and its school law remains a lasting memorial of its awakened national spirit. In 1792 the second partition of the country was effected; and in 1795, the third division, which ended the ancient kingdom of Poland.

The Divided Kingdom. — Since the division the Prussian government has suppressed the use of the mother tongue in the Polish schools, which have been gradually and completely Germanized. The similar attempt in the Austrian division was abandoned in 1867, and the Polish language was restored as the medium of instruction; and at present the educational conditions in Austrian Poland are comparable to those of Western Europe. In 1910, beside the two universities, Cracow and Lemberg, the polytechnic school and several technical schools of a lower order, there were in this division 84 secondary schools, with 34,853 students, and 5036 primary schools, enrolling 953,500 pupils, for a population of 3,982,033.

The Grand Duchy of Warsaw. — The Grand Duchy of Warsaw, formed by Napoleon from Polish provinces of Prussia under the treaty of Tilsit, 1807, continued the movement started by the Education Commission of Poland. In 1814 the Grand Duchy was united with Russia, and by the agreement of the Congress of Vienna, 1815, it was organized with other territory as a constitutional kingdom subject to the Czar. To this division of the ancient kingdom the name Poland is still applied. It comprises an area of 49,157 square miles and in 1909 had a population of 11,671,800.

Russian Poland. — The kingdom of Poland within the Czar's domain was given a separate educational system under the control of a Commission of Worship and Public Instruction. For a few years the former director of education in the Duchy of Warsaw, Stanislas Patocki, was retained as chief of the commission, and the progressive movement continued. During his administration, the University of Warsaw was created, 1816, and the following year it was opened with imposing ceremonies; a higher technical school and several middle technical schools were established, and secondary schools and primary schools multiplied; but reactionary influences set in and the futile revolt of the Poles in 1830 resulted in the reduction of the "Congress kingdom" to the state of a Russian province. From that disastrous year to a very recent date, the history of education in Russian Poland is a history of suppression and conflicts, excepting for a brief respite during the administration of the Marquis Alexander Weilopolski, a Polish nobleman who was appointed Director of Education in 1861. Moved by his counsels, the Emperor Alexander II issued the decree of May 8, 1862, reëstablishing, in a measure, the educational policies of the Duchy of Warsaw. The work thus revived was terminated by the second and fatal revolt of the Poles in 1863.

Officially Poland no longer exists. After the suppression of the second revolt, the Russian division was designated as the territory of the Vistula, and later as the Vistula government. Throughout its whole extent the Russification of Polish institutions has been enforced with relentless severity. The use of the Polish language as the medium of instruction was prohibited in the secondary schools at first, and finally even in the primary schools and the Polish university at Warsaw was transformed into a purely Russian institution. This policy of suppression was embodied in successive ukases and administrative orders which were ruthlessly executed by the Russian teachers and supervisors appointed over the Polish schools. The resistance of the Polish people culminated in 1905, when the whole body of Polish pupils withdrew from the schools. Parents came together in a great public assembly and sustained this action, and finally the entire force of teachers joined in the protest and with one voice petitioned for the right to establish private schools under the control of the Polish society, in which the native language should be employed and the history and geography of Poland included in the curriculum. The Russian government yielded so far as to authorize the maintenance of private schools without the privilege of the government examinations and diplomas. The following year a law was passed which legalized private societies and thus opened the way for the remarkable development of social self-help which has characterized the last few years in Russian Poland.

Most prominent among the societies which sprang into existence was the *Macierz Szkolna* (Mother of Schools), which after vigorous and successful work was dissolved by an order of Dec. 15, 1907. The corporation of merchants at Warsaw also established many schools. The chief private schools are models of construction, equipment, and hygienic arrangements, and are provided with systematic medical inspection. Polish gymnastic societies for promoting school plays, school colonies, and manual work in schools, have also achieved excellent results in the last few years.

According to the last issue of the Year Book of Russia (1911) there were 6649 schools in this government in 1909, having an enrollment of 306,185 pupils distributed as follows: high schools, 1743; middle schools, 16,236; special schools, 15,725; primary, 272,481; but as the private schools are not included it is impossible to form any idea as to the extent of school attendance on the part of the Poles. It is, however, significant that whereas the proportion of illiterates to the population above nine years of age in the other divisions of the Empire ranged from 70 to 93 per cent according to the last estimates (1897), in the Polish section it was only 59 per cent.

Higher Education. — The survival of the Polish national spirit through the century of dispersion and suppression is one of the most striking facts in modern history. It is a caste spirit intensified by heroic traditions embodied in a noble literature. The extent to which the Polish people attend school under present conditions is a question, therefore, of less significance than that of the institutions which still preserve the language and record of their national distinction. In the number of these must be included the University of Königsberg, established in 1544 by Albert, Duke of Prussia, for the purpose of promoting religious, literary, and scientific culture among the different peoples inhabiting his dominions. Failing in the effort to secure the sanction of the Pope, this Protestant university received a charter in 1561 from King Sigismund II of Poland. The special object of the theological faculty of the university was to train ministers who could teach the scriptures to the Polish and Lithuanian subjects of the duke in their native languages, and with these peoples its history and activities have been identified. The university still maintains a Polish " seminar."

Cracow and Lemberg, in Austrian Poland, are essentially Polish universities. The Imperial Academy of Sciences maintained in connection with the former is the present center of the highest intellectual activity of the Poles without regard to their geographic location. The University of Lemberg was a feature of the educational reform planned by the Empress Maria Theresa, which was not accomplished until 1784, a few years after her death. The university was completed under the present emperor in 1894 by the establishment of the medical faculty. Like the University of Cracow, Lemberg possesses a valuable library. Although the University of Warsaw has been transformed into a Russian institution, its library is especially rich in works of Polish literature, history, and law. The principal archives of the Polish kingdom are also at Warsaw. This city, capital of the Vistula government, is therefore the center of research in respect to a history which on account of interrelations is a matter of equal concern to all Slavonic and Teutonic nations.

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POLIOMYELITIS. — See INFANTILE PARALYSIS.

POLITICAL ECONOMY. — See ECONOMICS.

POLITICAL EDUCATION. — See CITIZENSHIP, EDUCATION FOR; PATRIOTISM, EDUCATION IN.

POLITICAL SCIENCE. — Definition, Method, and Relation to Allied Sciences. — Political science (*Staatswissenschaft*) is defined by Bluntschli as " the science which is concerned with the State, which endeavors to understand and comprehend the State in its fundamental conditions, in its essential nature, its various forms or manifestations, its development." Some writers, especially in France, prefer the plural form, " the political sciences " (*sciences politiques*), arguing that there is no single science of the State, but rather a group of related sciences. The term " politics," used by many writers, is open to the objection that in popular usage it denotes the concrete and often partisan art of government, rather than the systematic study of political forms and phenomena. The term politics arose among the Greeks and referred originally to the government of the city (πόλις). With the decline of the city States and the development of modern national organizations, the term was correspondingly widened. The State, the institution with which political science deals, may be defined as a population which occupies a definite territory and which is politically organized by means of a government which formulates and administers, in the form of law, a sovereign will over all individuals and associations of individuals within the State, and which maintains a sovereign independence by adjusting the mutual powers and obligations of the State in its dealings with other States.

The scientific investigation of political phenomena is carried on under certain difficulties. The facts of history cannot be reproduced or made the subject of experimentation, and few artificial devices can be used to direct or increase the observation of facts or the registering of results. Besides, social facts do not recur at regular intervals, nor follow invariable general laws. The influences affecting them are complex and closely interrelated, and the actions of individuals can seldom be accurately predicted. Accordingly, political science employs a variety of methods. Experimentation is carried on whenever the organization or activities of government are consciously modified. The biological method which attributes to the State the qualities of a living organism emphasizes the unity and continuous evolution of political forms. The psychological method, popular among French writers, interprets social phenomena in terms of psychological laws. The juridical method, favored by the Germans, views the State as a legal, rather than a social, institution, and draws its conclusions from an analysis of the State's relations in public law. The historical and comparative method aims to discuss the origin and development of political forms, and the laws of political causation; and by selection, comparison, and elimination to derive general principles from the mass of historical data. This method, probably the most fruitful, is also the most difficult, being especially liable to errors resulting from personal bias or from the omission of elements which invalidate the most important conclusions.

The growing realization of the fact that no science dealing with mankind has special data all to itself, and that political phenomena are not the manifestations of a distinct side of human nature nor of a distinct species of human beings, has emphasized the relations between political science and the other social sciences. Starting with those acts that are specifically governmental, political science works gradually through related acts into the general field of human conduct. From history it draws its data; in sociology it observes the development, structure, and functions of social institutions closely related to the State; in economics it finds that motives and action chiefly concerned with the production, distribution, and consumption of wealth, influence and are influenced by political forms and functions; in ethics it sees a close connection throughout the whole development of morality and of law. Modern thought accentuates relations rather than differences, and by utilizing the mass of materials gathered in allied fields, political science is no longer founded upon shifting speculations, but is possessed of sounder knowledge of the nature and tendencies of the State, can build up more scientific principles of political causation, and can make possible more rapid and rational political progress.

Historical Development. — To the historical development of political science two main influences have contributed. Rulers and statesmen, in the work of practical government, necessarily conceive certain political principles upon which to base their actions. These are embodied in institutions, or are found, expressed or implied, in laws, constitutions, treaties, and state papers, in the writings and speeches of politicians, and in general public opinion. Such principles, often arising unconsciously, are seldom comprehensive or systematic, but are often full of prejudices, legal fictions, and inconsistencies. On the other hand, political philosophers, outside the current of actual government, have frequently attempted to build up theories of the State. Sometimes these have aimed to explain the origin of the State, to justify its authority, or to determine the scope of its activities. Again they arise to uphold or to attack certain existing governmental forms or methods. Sometimes these theories have been purely speculative or idealistic in nature. Again, they have resulted from the observation and analysis of existing or historical governmental institutions. Through a combination and interaction of these influences the science of the State has, in the main, developed.

Political speculation proper scarcely existed before the rise of Greek philosophy. In the Oriental nations thought was based upon tradition and belief rather than upon reason, and sufficient political liberty to permit questioning seldom existed. The Greeks, however, having no powerful priestly class and few fixed dogmas, viewed the State and law as " natural " in origin, as representing the highest form of life; and, in their small city units, developed considerable individual freedom and much keen thinking in politics. In the philosophical idealism of Plato and in the more scientific observations of Aristotle are found the best statements of Greek political theory. While the Romans took their philosophy, with little modification, from the Greeks, they worked out valuable practical principles of government. The ideas of positive law, systematic jurisprudence, sovereignty, citizenship, municipal and colonial administration, and world empire were among their contributions. They also emphasized the value of checks and balances, and of political compromises in securing stable government. Polybius and Cicero best state their theories. After the fall of the Roman Empire, the doctrines of the Christian Church and feudal customs based on landholding furnished the chief political principles, and medieval theory was chiefly concerned with the proper relation of Church and State. The papal party, represented by Gregory VII, Innocent III, and Thomas Aquinas, claimed superiority for spiritual power as more directly conferred by God. But by the fourteenth century the revived study of Roman law furnished principles for the defenders of civil power, and Dante and Occam supported the national monarchies then arising. The Renaissance spirit in politics was represented by Machiavelli, who replaced scholastic deductions by actual investigation and comparison, and again brought political theory in touch with actual facts. He also divorced politics from religion, justified conquest, and recognized nationality. After the Reformation, Calvin's doctrine of democracy in church government was applied by his followers in Holland, England, and America as a foundation for political liberty. (See CALVIN; CALVINISTS AND EDUCATION.) Meanwhile, the existence of a number of well-organized national monarchies, having relations one with another in war and peace, prepared the way for modern political science. Bodin, in the sixteenth century, made the first systematic study of politics since Aristotle; and in the seventeenth century Grotius (*q.v.*) laid the foundations of international law. In the writings of these men the modern theory of sovereignty as internal supremacy and external independence was established. The growing contest between king and people next influenced political theory. The doctrine of divine right upon which the absolute monarchies were based was upheld by James I and Bossuet, but was attacked by the growing belief in " natural rights " and in the " social contract " as the basis for political authority. Hobbes utilized this theory to support kingship, but in the hands of Locke and Rousseau the new theory paved the way for popular sovereignty. Montesquieu pointed out the influence of physical environment and emphasized the value of the separation of powers in government. In the nineteenth century the growth of historical knowledge and the biologic doctrine of evolution chiefly influenced political science. Modern political science, then, begins with Bodin, Grotius, Pufendorf, Hobbes, Locke, Rousseau, and Montesquieu. During the last century the science has been enriched by the work of numerous scholars, among whom may be mentioned Von Mohl, Waitz, Holtzendorff, and Bluntschli in Germany; De Tocqueville and Laboulaye in France; Lewis, Austin, Maine, Mill, Freeman, Sidgwick, and Seeley in England; and Hamilton, Madison, Lieber, Woolsey, and Burgess in America.

History of Academic Teaching. — As an academic study, politics arose as a division of practical philosophy, to which the theory of " natural law " was added in the seventeenth century. During the eighteenth century the Cameralistic sciences (see ECONOMICS) developed, and during the nineteenth century the separate political and socio-economic sciences were evolved. The systematic and juristic phase of political science has always been closely connected with the study of law; and considerable impetus, especially from the comparative standpoint, has been given by the recent growth of historical knowledge and interest.

German universities have held the foremost place in the development of political science, Dominicus Arumäus first lecturing on public law at the University of Jena between the years 1605–1637. Between 1661–1668 Pufendorf lectured on the new theory of " natural law " at the University of Heidelberg. During the latter part of the seventeenth and the first half of the eighteenth century the University of Halle, and during the latter half of the eighteenth century the University of Göttingen, were the chief centers of political studies. Beginning with the nineteenth century, political science shifted gradually from a " natural law" to an historical basis, and the political transformations through which Germany was passing gave additional impetus to political studies. Among the teachers of this period were Zachariä and Von Mohl at Heidelberg. By the middle of the nineteenth century the increasing knowledge of political institutions in other parts of the world made possible the comparative method of study. Bluntschli, who followed Von Mohl at Heidelberg and Gneist at Berlin, typified this development. Since the establishment of the German Empire a host of scholars, among whom may be mentioned Laband, Brie, and Jellinek, have emphasized the juridical rather than the historical method, and have paid particular attention to the nature of the federal State. In a few universities, Tübingen for example, studies relating to public affairs are combined in a separate faculty; but in most German universities the courses are grouped under the faculties of law or of philosophy. The first seminar in political science was organized at Jena in 1849. The *Statistiche Seminar* at Berlin was founded in 1862, and between 1871–1876 a number of the leading universities established seminars for the investigation of political and economic problems.

The chief influence in the academic development of political science in France came from Laboulaye, a contemporary of Bluntschli in Germany and of Lieber in America. His lectures were given at the *Collège de France* during the third quarter of the last century. At the University of Paris, political science is taught in the faculty of law. Unusually valuable lectures in practical politics are given at the *École libre des sciences politiques.* In England the strong classical and mathematical traditions of Oxford and Cambridge offered considerable resistance to the newer social sciences. To the professorships of civil law established by Henry VIII, chairs of modern history were added at Cambridge in 1724 and at Oxford in 1854. By 1800 English law had been made a separate department in both universities. International law and diplomacy were introduced in 1854 at Oxford and in 1867 at Cambridge, and Oxford added in 1869 a professorship of jurisprudence. At present there is a professor of colonial history at Oxford and a lecturer in politics at Cambridge. There are, however, no distinct departments of political science, as in the German or American universities, courses in government being incidental to law or to modern history. For example, Austin, Maine, Bryce, Dicey, and Pollock have held chairs of law, Sidgwick was a lecturer in moral science, and Freeman and Seeley taught political science in connection with modern history. Seeley's "conversation-class" at Cambridge was a sort of political science seminar. Separate chairs of political science are found in some of the younger universities, Manchester, for example. Much of the best writing on political subjects in England has been done by men not connected with the universities.

Jefferson's (*q.v.*) influence dominated the first teaching of politics in America. Changes made by him in 1779 at William and Mary College emphasized political and legal studies, and the curriculum which he constructed for the University of Virginia (1825) contained government as one of its main groups. Meanwhile, in the North, crude beginnings in political studies, usually in connection with philosophy, were being made by McVickar at Columbia (1817) and by Bowen at Harvard (1850). A more direct impetus was given by Woolsey, who, as president of Yale in 1847, taught political philosophy and international law. One of his students, Andrew D. White, who studied later in France and Germany, further emphasized political studies, first as professor at Michigan (1857–1862), then as president of Cornell (1868–1885). The most powerful stimulus to the teaching of political science was given by a German, Francis Lieber. In 1857, on the advice of McVickar, a separate professorship of history and political science was established at Columbia, and Lieber, who for twenty years had been teaching and writing at Columbia, S.C., was called to this chair. He introduced German methods and ideals, and began in America the fruitful coördination of political science with history, rather than, as formerly, with metaphysics. Lieber's professorship was abolished in 1865, but was reëstablished in 1876 when John Burgess, who had studied in Germany and taught political science and history under Seelye at Amherst (1873–1876), took Lieber's place. In 1880 Burgess organized the School of Political Science at Columbia, Mayo Smith, Goodnow, and Munroe Smith being his first assistants. This school sent many students to study in Germany and has exerted a preponderant influence on the study and teaching of political science in this country. More recent teachers of politics include Hart and Lowell of Harvard, Dunning, Moore, and Beard of Columbia, Wilson of Princeton, Willoughby of Johns Hopkins, Merriam of Chicago, Rowe of Pennsylvania, Reinsch of Wisconsin, and Garner of Illinois.

Academic Organization and Method.— American colleges offer a considerable and growing amount of undergraduate instruction in political science. A recent study based on forty representative colleges shows that 72 per cent of these institutions offer courses in general political science or comparative government, 50 per cent teach American government, 45 per cent teach municipal government, and that courses in political theories, American politics, and American diplomacy are given in from 10 to 30 per cent of the number. In addition, fundamental courses in jurisprudence, international law, and American constitutional law are frequently offered. Some of these colleges have distinct departments of political science; but in others the work is organized under the department of history, or, in some cases, in connection with economics or sociology. The usual method of instruction is based upon general textbooks, and consists of lectures and discussions, collateral reading, oral and written reports, and periodical examinations. Clubs for the study of current events are often formed, and, when conditions permit, the operation of actual politics is observed or practical reform work is attempted. Since the courses are usually elective and limited to juniors and seniors, the total proportion of students receiving collegiate instruction in political science is comparatively small.

In the organization of the departments of political science in the leading American universities little uniformity can be found. At Chicago, Johns Hopkins, and Wisconsin there are separate departments of political science; at Harvard, history and government are grouped together; at Yale, the social sciences, law, and history are combined; and at Columbia, the faculty of political science includes the departments of history, economics, sociology, and political science proper. The usual courses include constitutional, administrative, and international law, political theory, comparative government, and certain phases of American government, especially municipal and colonial government, and political parties. The more elementary courses are usually limited to undergraduates; certain other courses are open to both undergraduates and graduates; and the more advanced courses are offered to graduates only. A clear-cut distinction between undergraduate and graduate courses and methods can scarcely be said to exist. However, in graduate courses the lectures are not dogmatic presentations of fundamental principles, but aim rather to open up the literature of the subject and to suggest its problems. In the seminar, instructors and students meet periodically for discussions and reports based on investigation and research. Voluntary clubs are often organized for the purpose of discussing or debating political topics, or listening to lectures on public affairs.

Two especially valuable series of publications, resulting from the investigations of university instructors and students, are the *Johns Hopkins University Studies in Historical and Political Science*, published monthly since 1883; and the *Columbia University Studies in History, Economics, and Public Law*, consisting of over one hundred monographs, issued since 1891. The study of political science is also furthered by associations affiliated with several of the large universities. The Academy of Political Science in the City of New York, organized in 1880 under the direction of the Faculty of Political Science of Columbia University, has, since 1886, published the *Political Science Quarterly*, and, since 1910, issued four volumes of Proceedings each year. The American Academy of Political and Social Science, organized in 1889, is affiliated with the University of Pennsylvania and publishes its *Annals* bimonthly. The American Political Science Association, established in 1903, is a national organization for " the encouragement of the scientific study of Politics, Public Law, Administration, and Diplomacy." It holds annual meetings, usually in conjunction with the American Historical Association, publishes the addresses delivered at such meetings, and controls the quarterly publication of the *American Political Science Review*.

Political Science and Practical Politics. — The study of political science lies in the border zone between those subjects that are especially of cultural value and those that are more specifically practical and professional. From the standpoint of the former, it brings the student in touch with the historical development of thought and of institutions, and familiarizes him with the issues and problems of modern civilization. From the standpoint of the latter it furnishes a direct foundation for law, government service, journalism, and good citizenship.

The increasing importance of political science in the university is both a cause and a result of the increasing importance of the university in practical politics. The proportion of college graduates in public office is growing each year; men actively engaged in university instruction have recently been candidates for important elective offices; and the influence of the university and its affiliated alumni associations is a valuable political asset. University trained men hold important positions in the civil service, and university teachers are frequently appointed to serve on governmental boards and commissions. The scorn in which the practical politician formerly held the academic teacher of politics is disappearing, and the State tends more and more to apply scientific political methods in actual government. History and present conditions are investigated before action is taken on new questions, and an increasing use is made of statistics. Political phenomena are observed and classified, and generalizations are made from the data thus collected. For this work, dealing with conditions both at home and abroad, the State draws largely upon university teachers of political science. Especially close is the connection between academic and practical politics in the state universities of the Middle West; in some cases, as in Wisconsin, the university has become in effect a coördinate department of state administration, and exerts a powerful and direct influence upon public opinion and upon legislation.

In Europe an even closer connection between academic and practical politics is maintained by the Seminary of the Prussian Statistical Bureau at Berlin and the independent School of Political Sciences at Paris. The former, a government institution opened in 1862 under the chief of the Bureau of Statistics, aided by various university professors, is a laboratory of political science. It trains university students for the higher branches of the civil service and collects a vast amount of data valuable for both the scholar and the statesman. The latter, founded in 1871 as a private joint stock company, prepares for public affairs, especially for certain branches of the administration under the civil service system, and many of its lecturers are men prominent in public life. The establishment of a similar institution at Washington has often been urged.

Scope and Problems. — The scope of political science and its main divisions are determined by several broad categories under which the State may be viewed. There is, first, a distinction between the subjective and objective phases of the State. The former exists in the human mind and creates political theory; the latter exists in outward manifestations and gives rise to political institutions. Between political theory and political institutions the relation is close, each being both a cause and a result of the other. A second distinction views the State as both static and dynamic. From the former standpoint emphasis is laid on organization; from the latter, on function. Political science must tell what the state *is*, and what it *does*. The physical background of the State in population and territory, the constitutional organization of government, with its separation into legislative, executive, and judicial departments, and its division into national, local, and colonial agents, the governmental position of the electorate and of political parties, must all be described. The activities of the State are determined by the fundamental relations of individual to individual, some of which the State regulates under private law; the relations of State to individual, which the State determines in its public law; and the relations of State to State, which are regulated by the principles called international law. The share of individuals in governing authority and their freedom from governmental interference open up important questions of sovereignty and liberty. Views as to the proper scope of state function vary from an extreme individualism to an extreme socialism. Opinions as to the proper nature of international relations show scarcely more agreement. A third distinction views the state as past, present, and future. The origin and political development of both theory and institutions must be traced; present conditions both as to organization and functions must be described; and future tendencies may either form the basis of political speculation or lead to active efforts at reform.

Certain fundamental changes have taken place during the past quarter century in the attitude of mind with which political scientists approach their subject. The doctrine of natural rights is now seldom referred to as a basis for political practice; neither are political events ascribed to the intervention of a divine Providence. There is also considerable hesitation in explaining broad and complex movements on the basis of racial characteristics. The speculative theorists and the builders of utopias have been replaced by men trained in historical research and in the scientific theory of evolution. Records of past political systems and theories are carefully studied, present day conditions are minutely analyzed and described, and principles of causation are diligently sought. Modern scholars, freeing themselves as far as possible of personal bias, and making little effort to praise or condemn, or to point morals, aim to view the origin, development, organization, relations, and functions of the state, in the light of past conditions and present tendencies, constantly remembering the close connection between the political activities of mankind and those other phases of development which make up the total process of social evolution. R. G. G.

See Civics for treatment of the subject in the lower schools.

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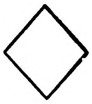
POLYGON. — A word derived from the Greek and meaning many-angled. In elementary geometry the term is usually limited to convex plane figures bounded by a continuous line, made up of straight lines. We may, however, have concave polygons, cross polygons, and polygons that are not in the same plane (skew polygons).

A polygon is said to be regular if its sides are equal and its angles are equal. The study of the regular polygons forms a part of the work in elementary plane geometry. Of the principles of polygons, one of the most important is that relating to the sum of the angles, this sum being equal to $(n-2)$ times 2 right angles. The study of the stellar polygon was prominent in medieval education. D. E. S.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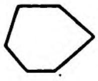
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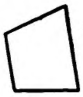
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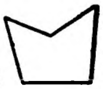
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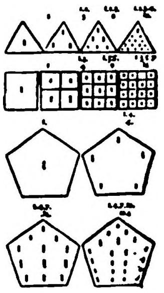
POLYGONAL NUMBERS. — The Greeks paid much attention to the theory of numbers, and there still remain in arithmetic certain relics of their activity in this field, as in the treatment of prime numbers, even and odd numbers, and square and cube numbers. A square number derives its name from the fact that 4, 9, 16, 25 . . . dots can be arranged in the form of a geometric square. A square number is a special form of a polygonal number, for it is possible to arrange the dots in the form of other polygons, such as triangles, pentagons, etc. Among the polygonal numbers studied by the Greeks, and found in the medieval education, are the following: —



Triangular,	1,	3,	6,	10,	15,	. . .
Square,	1,	4,	9,	25,	36,	. . .
Pentagonal,	1,	5,	12,	22,	35,	. . .
Hexagonal,	1,	6,	15,	28,	45,	. . .

With the exception of square numbers the polygonal numbers are no longer studied. D. E. S.

POLYHEDRON. — A term derived from the Greek and meaning many-faced, or many-seated. A regular polyhedron has all of its faces congruent regular polygons. There are five regular convex polyhedrons, and these were studied so extensively in the school of Plato as to have the name of "Platonic bodies." The Greeks attributed particular mystic significance to these various bodies. One of the fundamental properties of convex polyhedrons is that the number of faces plus the number of vertices equals the number of edges plus two. The polyhedrons of chief importance in the teaching of elementary mathematics are usually considered to be those which are needed in the problems in mensuration; namely, the cube, parallelepiped, prism, pyramid, and frustum of a pyramid. As a formula of mensuration the most important one is the so-called prismatoid formula, that $v = \frac{h}{6}(b + b' + 4m)$ where h = height, b and b' = the bases, and m = a mid-section parallel to the base. (See GEOMETRY.) D. E. S.

POLYTECHNIC HIGH SCHOOLS. — See INDUSTRIAL EDUCATION; TECHNICAL EDUCATION.

POLYTECHNIC INSTITUTE, BROOKLYN, N.Y. — See TECHNICAL EDUCATION.

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